Hitchcock's Machine Tool Blue Book

ULY, 1936 THIRTY-FIRST YEAR

A TOOL ROOM NECESSITY

Cataract HARDINGE

Cataract HARDINGE

PRECISION MD5 MILLING MACHINE

Ease of operation and high spindle speeds, combined with extreme accuracy, make this machine necessary in the modern tool room. Self-contained electrical drive—get complete details.

Ask for Bulletin MD5

HARDINGE BROTHERS, INC., - - ELMIRA, N. Y.

CHICAGO — NEW YORK — DETROIT

UBLISHED AT 508 So. DEARBORN ST. CHICAGO

Low Priced, Dry Cutting

HACK SAWS

Count up Features and you'll Count out Competitors

MARVEL

HACK SAWS Nos. 1 and 2

Check over the features of the MARVEL Motor and you see why 80% of the dry cutting general purpose Hack Saws in use are MARVELS.

Heavier, sturdier construction with (1) Heavy Rigid Frame, (2) V-Bearing with Screw Take-up, (3) Adjustable Blade Tension, (4) Swivel Vise, (5) Automatic Stop, (6) Feed Pressure Adjustment, (7) All-Front Control, (8) Adjustable Stroke, (9) Stationary or Portable, Belt or Motor Driven Models, (10) Low Price:

No. 1 Capacity 6"x6" $42.00
No. 2 Capacity 8"x8" 72.00

Write for Catalog

Armstrong-Blum Mfg. Co.

"The Hack Saw People"

341 N. Francisco Ave., CHICAGO, U. S. A.

DO IT—

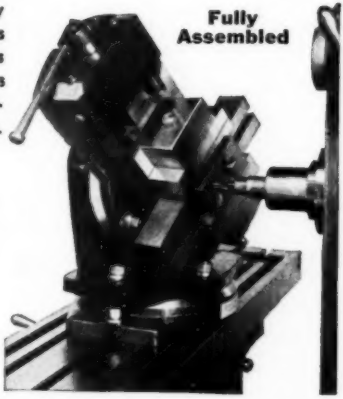
Better—Faster for Less!

with ODIN UNIVERSAL PRECISION VISES

They quickly pay their costs in savings on High Tool Costs —Expensive Fixtures —Patterns and Castings—Extra Set-Ups.

Investigate the money saving possibilities of ODIN VISES.

Write today for full facts and prices.



ODIN Vises have Interchangeable Jaws, Hardened Ground Parallels, and provide positive clamping at every angle and degree. They are constructed of drop forgings and semi-steel castings and are furnished with Horizontal and Vertical Bases indexed 180°. All parts are interchangeable and all handles are removable. They can be used in part or fully assembled.

ODIN UNIVERSAL CORPORATION

CHICAGO

Sales Division
110 S. Dearborn St.

Telephone
Franklin 3281

Rivett

DRAW-IN COLLETS AND CHUCKS

SPRING TEMPERED

Scientifically heat treated to a true spring temper, "RIVETT MARK" collets resist wear and hold their spring longer than collets of any other make. *Write for Bulletin 100-B.*

ORDER FROM STOCK

CHICAGO
R. E. Ellis Engineering Co.,
621 W. Washington Blvd.,

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149 E. Larned St.

RIVETT LATHE & GRINDER INC.

BRIGHTON, BOSTON, MASS.

Hitchcock's
Machine Tool Blue Book

Selected Circulation — 20,000 Monthly

JULY, 1936 — THIRTY-FIRST YEAR

AN ELECTION MESSAGE

Business is showing surprising vitality—and despite election fears it is forging ahead to new peaks—at a time when activity usually declines. Consider for a moment these facts and their significance from a business standpoint.

Steel production at 71% of capacity or 82% ahead of a year ago.

Electric power output is up 14%.

Automobile production is 25% ahead of last year.

Building contracts in May were 70.5% above May, 1935.

Carloadings are 10% better.

Retail sales are up 12%.

Mail order sales have jumped 31%.

These remarkable gains give promise of increased machine tool sales. Further, with Fall activity only a few weeks away the time is ripe for progressive manufacturers of machine tools and shop supplies to place their names before as many as possible of the buyers who use their products. The BLUE BOOK reaches far more industrial plants for the cost than any other paper in the machine tool field.

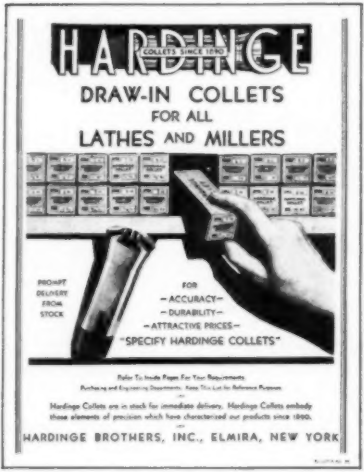
Published By

Hitchcock Publishing Co.

508 S. Dearborn St., Chicago, Ill.

Consult the Classified Finding Index for your requirements

COLLET AND FEE



Ask for this bulletin No. 36
if you have
LATHES and MILLERS

HARDINGE COLLETS FOR: American, Ames, Boye & Emmes, Carroll & Jamieson, Chard, Cincinnati, Cisco, Dalton, Flather, Greaves-Klusman, Hamilton, Hendey, LeBlond, Monarch, Porter Cable, Pratt & Whitney, Rahn Larmon, Reed-Prentice, Rivett, Rockford, Sebastian, Seneca, Sidney, South Bend, Springfield, Stark, Sundstrand and our own Hardinge Cataract Lathes.

HARDINGE COLLETS FOR: Ames, Becker, Burke, Pratt & Whitney, Reed-Prentice, Rockford, Stark, Sundstrand, Van Norman and our own Hardinge Cataract Millers.

Bulletin No. 36 gives complete information; dimensions of standard collets; lists attractive prices; makes ordering easy. Gives location of collet stocks in six important centers in the United States.

—SPECIFY HARDINGE COLLETS—

HARDINGE BROTHERS, Inc. - - - ELMIRA, N. Y.

FINGER SECTION

Ask for this catalog No. 34A
if you have
AUTOMATIC and HAND SCREW MACHINES

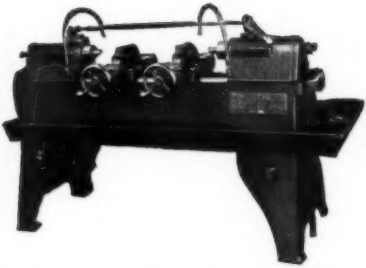
MORRISON COLLETS, FEED FINGERS, MASTER COLLETS, MASTER FEED FINGERS AND PADS FOR: Brown & Sharpe, Cleveland, Cone, Gridley, National Acme, New Britain, Davenport, etc., Automatics.

MORRISON COLLETS FOR: Bardons & Oliver, Cincinnati, Foster, Garvin, Pratt & Whitney, Warner & Swasey, etc., Hand Screw Machines.

Catalog No. 34A gives complete ordering information and lists attractive prices. Illustrates and describes Style "B" Morrison Master Feed Fingers and Pads which eliminate scoring of stock.

—STANDARD SIZES FROM STOCK—

MORRISON MACHINE PRODUCTS, Inc., ELMIRA, N. Y.



CENTERING MACHINES

For drilling, reaming, tapping, countersinking and similar operations; on one end or both ends at once. No. 56 shown. Others available. Accurate. Fast.

SUNDSTRAND MACHINE TOOL CO. · ROCKFORD, ILLINOIS, U.S.A. ·

BENCH CENTERS

BALANCING TOOLS

Made in 5 sizes, with capacities from 800 lbs. to 24,000 lbs. Others for propellers, flywheels, pulleys, etc.

Accurate, compact, portable. Adjustable heads. Quick-acting spindle. Seven sizes.

These Sundstrand tools, like our Lathes and Milling Machines, cut costs and make work easier. » » »
INVESTIGATE! Address our Dept. H for details.

Stock Shipment on this "Buffalo" 8" Angle Shear

An unusual opportunity to get stock shipment on this large angle shear, (capacity; angles up to 8"x8"x1", either hand mitre) weighing 25,000 lbs. If you can use a machine of this size and type, we suggest you WRITE OR WIRE for Price.

Buffalo Forge Co.

161 Mortimer St.,
Buffalo, N. Y.

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

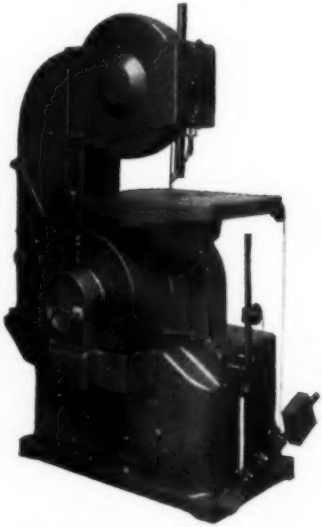
GROB OPEN END BAND SAW

for

NO WELDING **INTERNAL** **NO BRAZING**

and External Sawing

Set up for internal sawing in 30 seconds. Positive Drive to the saw band insures fast cutting—an exclusive feature.



GROB BROTHERS,
West Allis,
Wisconsin

Mail full information to us on the Open End Band Saw and other Grob Modern Die Making Machines.

FIRM .....

ADDRESS .....

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Collets Of Every Description

for All Purposes

What are your requirements on chucking?

Modern Collets are made of a special steel and have a hard, long-wearing surface with a tough, springy core. Modern Collets are guaranteed accurate in design and taper is ground true with the hole. They are deeply corrugated to give a positive grip.

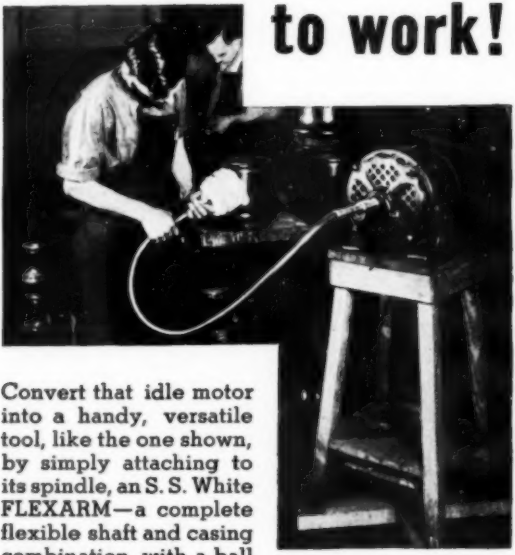
Modern Collets are designed to give a better gripping surface because of the deeper and better formed corrugations. Locking fingers and shoes will last longer, and Modern Collets exert far less strain on chucking cam and chucking cam roller pin.

For complete information on feed-fingers, cams, shaving tools and various other parts for screw machines, write for our catalog No. 32.

Modern Collet & Machine Co.

401 Salliotte Street, Ecorse, Michigan

Put that idle motor to work!



Convert that idle motor into a handy, versatile tool, like the one shown, by simply attaching to its spindle, an S. S. White FLEXARM—a complete flexible shaft and casing combination, with a ball bearing motor coupling on one end, and a hand piece on the other which holds burs, drills, rotary files, abrasive points, disks, wheels and other tools. FLEXARMS come in sizes suitable for motors from 1/15 to 1/4 H. P.

Catalog TA gives details . . . write for a copy.

● The **S. S. WHITE** DENTAL MFG. CO. ●
INDUSTRIAL DIVISION
10 East 40th St., Room 2310H, New York, N. Y.

When There's WORK *To Be Done*

There's a WYCO Tool to Suit Your Purpose

See your jobber for complete information on the Profit Producing WYCO Line.

FLEXIBLE SHAFT EQUIPMENT designed by WYCO for heavy-duty service is guaranteed for long life and freedom from trouble. Prices from **$35** to **$105.**

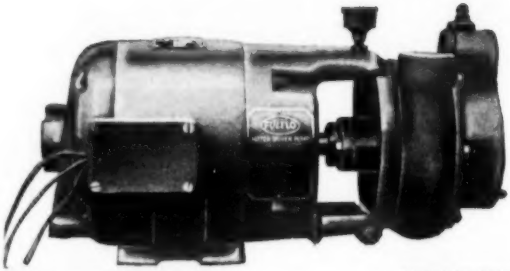
UNIVERSAL SPEED SAW, another WYCO product and a profit-maker for your shop. It saws wood or metal, fits any drill chuck and cuts accurately to the line, in any direction and at any angle.

WYCO MOTOR DISC, furnished with tilting table and 6 assorted discs, will make an efficient, high-speed grinder from a spare or unused ¼ to 1 h.p. motor. **$15.**

The WYCO Line

WYZENBEEK & STAFF, INC.

642 W. Washington Blvd., Chicago, Ill.



NEW AG3-M

TRADE MARK
"FULFLO"
REG. U.S. PAT. OFF.

CENTRIFUGAL WATER PUMP

MODERN

★ DESIGN
★ CONSTRUCTION
★ PERFORMANCE

SPECIFICATIONS

¼ H. P.—BALL BEARING—1725 R. P. M. MOTOR
25 GALLONS PER MINUTE WITH 10 FT. HEAD—
IRON BODY—BRONZE IMPELLER—
SPRING TENSION PACKING—
STRAIGHT OR PRIMING COVER OPTIONAL—
PUMP SHAFT REPLACEABLE.

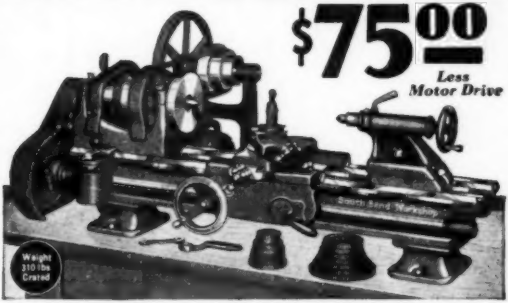
FULFLO SPECIALTIES COMPANY, INC.

BLANCHESTER, OHIO

This New 1936 Model Genuine South Bend

LATHE

$75.00
Less Motor Drive



9½" x 3' Workshop Bench Lathe with Horizontal Countershaft, ¼ h.p. reversing motor and switch, and belting as shown. **$98.25**

This New 1936 model 9" x 3' Workshop Bench Lathe is a back-geared, screw cutting precision lathe, capable of handling the finest, most accurate jobs in manufacturing, in the tool room and laboratory.

Lathe may be fitted with draw-in chuck and collets, grinder, taper attachment, milling attachment and 34 other attachments for all machine shop operations.

Write for Catalog No. 15

Shows this lathe in eight different drives and four bed lengths. *Sent Free.* **Easy Payments. Terms if desired.**

SOUTH BEND LATHE WORKS
193 E. Madison St.,
South Bend, Ind., U.S.A.

FREE! 34 Page Book

SOUTH BEND *Precision* LATHES

A NEW

DEVELOPMENT

FOR HIGH SPEED TAPPING

SEND FOR YOUR COPY OF
OUR NEW LITERATURE

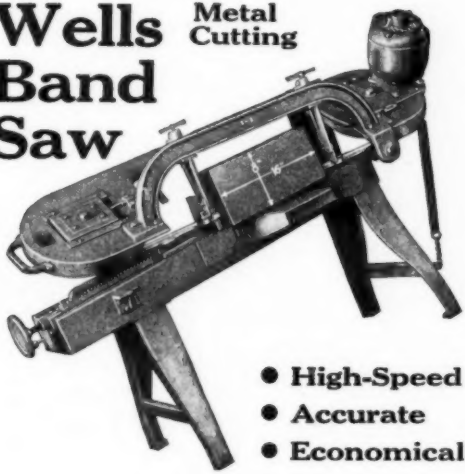
PROCUNIER SAFETY CHUCK CO.

"PIONEERS OF SAFETY TAPPING"

14 So. Clinton St., Chicago, Illinois

Wells Band Saw

Metal Cutting



- **High-Speed**
- **Accurate**
- **Economical**

ALL cutting can be done without the use of coolant. Records show 30 to 50% cutting time can be saved with this simple, sturdy, portable machine. Handles any metal, in any shape or thickness up to the generous capacity of the saw. For more detailed information, send for the illustrated booklet.

Built in two sizes
No. 8 capacity 8"x16"
No. 4 capacity 4" rd. or
7½"x3"—cuts all kinds of tubing.

WELLS MANUFACTURING CORP.
315 Seventh Avenue, Three Rivers, Michigan

ALL-ALLOY

RIDGID Wrench Strength and Performance Are Unbeatable

● With its all-over oil hardened chrome molybdenum alloy jaws and **new alloy housing and handle,** this RIDGID meets all Government and U. S. Navy tests. Housing is guaranteed unbreakable. You'll like the adjusting nut in open housing that spins easily in all sizes 6" to 60". And it's made in End Pattern for pipes against flat surfaces.
Try it—and you'll understand its popularity.

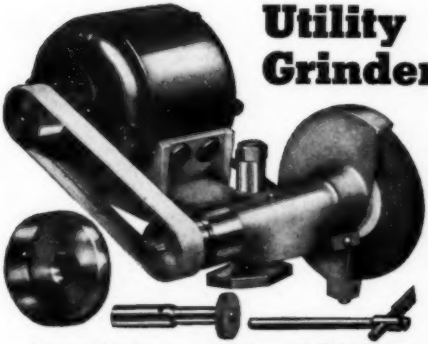
Ask your jobber.

The Ridge Tool Co.
Elyria, Ohio, U. S. A.

Reg. U. S. Pat. Off.

RIDGID PIPE TOOLS

Utility Grinder



Complete as above, $65.00

A Precision Tool; POWERFUL, RIGID, HIGHLY EFFICIENT, SIMPLE IN CONSTRUCTION.

MOTOR—Heavy duty ball bearing.

WHEEL SPINDLE—Ball Bearing automatically adjusted, regardless of temperature or wear.

¼ H. P., 110 volt, single phase, 60 cycle ..... $65.00.
½ H. P., 110 volt, single phase, 60 cycle ..... 75.00.
½ H. P., 110 volt, single phase, 60 cycle ..... 87.50.

E-Z SET BORING TOOL

Made in 3 Sizes

$13.50 to $27.50 with shank and bit

COMPACT, RIGID, Small body, large boring capacity. Adjustment actuated by a worm. Straight or taper shank. Adjusted to Jig and Fixture. Production or Maintenance work.

See your dealer or communicate direct with us.

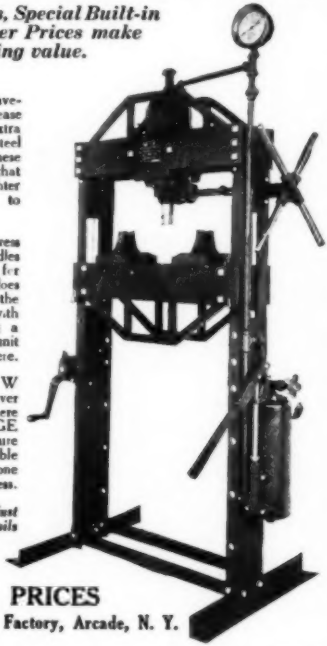
Sold on a Money Back Guarantee

F.A. MAXWELL COMPANY

386 Broadway Ave., BEDFORD, OHIO

KRW Hydraulic and Sensitive ARBOR PRESSES

New Improvements, Special Built-in Features and Lower Prices make them an outstanding value.



THE last word in convenience, efficiency and ease of operation. Built extra strong and well braced, with steel trusses electrically welded, these presses will withstand strains that would cause presses of lighter and inferior construction to buckle or collapse.

Hand wheel for sensitive press operations has sliding handles which pull out to the ends for increased leverage. Work does not have to be changed from the work table as is the case with other make presses having a separate sensitive press unit mounted on the side or elsewhere.

The importance of this K R W feature as a time and labor saver can be appreciated. Also there is NO EXTRA CHARGE for this important built-in feature on a KRW Press. Work table can be raised easily with one hand. A strictly one-man Press.

Write for special circular, just off the press, giving full details and specifications of all KRW Arbor Presses.

PRICES

F. O. B. Factory, Arcade, N. Y.

No. 37—35 ton Hydraulic and Sensitive Arbor Press $135.00
No. 37E—50 ton Hydraulic and Sensitive Arbor Press 164.00
No. 37F—70 ton Hydraulic and Sensitive Arbor Press 275.00

Gauge and fittings, $15.00 extra on all presses.

K. R. WILSON

10-16 Lock Street, Buffalo, N. Y., U.S.A.

EXPORT DEPARTMENT
90 West St., New York, N. Y.

WEST COAST BRANCH
722 Mateo St., Los Angeles

Patented

By Stacking in

STACKRACKS You Save Space, Time and Labor

The STACKRACK is just the thing on your assembly floor, in your machine shop, under workbenches for perfect "stock control". With STACKRACKS you will be able to stack materials at the point where they are the most needed without wasting valuable space. And besides they will eliminate the "stockroom parade" which is wasting employees' time.

With the STACKRACK boxes and pans are always in an orderly arrangement—neatly stacked one on top of the other—each unit being completely accessible without disturbing other units. STACKRACKS are made in single units each constructed of angle and formed steel, welded together. Each rack automatically locks in position on the rack underneath.

Don't pass up this opportunity to learn how you can better your storage problems by using STACKRACKS for greater plant efficiency.

STACKBIN CORP.

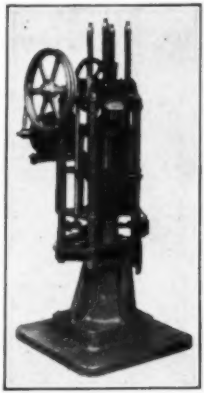
PROVIDENCE, R. I.

P. S.

When writing be sure to specify sizes of boxes to be stacked and approximate weight of contents.

Grob Brothers Introduce a New Velocity Action Briquetting Machine

Description of the new briquetting machine introduced recently by Grob Brothers, of West Allis, Wis., must stress added safety features and the development of an entirely new principle of briquette making. In making briquettes of metal chips, the new Velocity-Action Grob utilizes both spring tension and gravity, so that the machine itself is subjected to no strain.



The working mechanism of the machine shown in the accompanying illustration consists chiefly of a main drive shaft which revolves at constant speed and a ram connected to a crank which is independent of the main shaft. A dog on the main shaft lifts the crank to its upper position, where the ram is released. From here spring tension and gravity both act on the ram, so that it travels ahead of the crank on the pressure stroke.

The lower part of the ram carries a hardened steel plunger, which when the ram drops, enters a hardened steel bushing filled with the metal chips. Several of these bushings, mounted on a turntable, pass through the loading and ejecting positions.

A number of safety devices are incorporated in the machine. Should any piece of metal project above the surface of the bushing, a safety door, held shut by heavy springs, will open to let the piece of metal pass along with the bushing. The instant this door opens, a latch will hold the ram in the upper position. If the machine is empty or clogged, so that no chips enter the bushing, a limit switch, actuated by the lower drop of the ram, will shut off the motor.

Machines for the market are being built to produce briquettes from two and one-half to four inches in diameter.

NEW! MODERN!

★ MODERN DESIGN ★
MODERN CONSTRUCTION

The new Atlas lathes were designed and built to give more value—accuracy—efficiency and satisfaction than ever before during the 25 years Atlas has been building precision shop equipment. The back-geared model shown has 36" bed, 10¼" swing, and takes 18" between centers. Accurate to .001" for those precision jobs in manufacturing, tool room, or laboratory. Can be fitted with attachments for all machine shop operations.

Other new Atlas metal lathes priced from $35.50 up. Sold on monthly payments if desired. 2 weeks trial. Money back guarantee. Send for latest catalog of metal and wood working lathes, drill presses, tools, and attachments — illustrating today's outstanding equipment values.

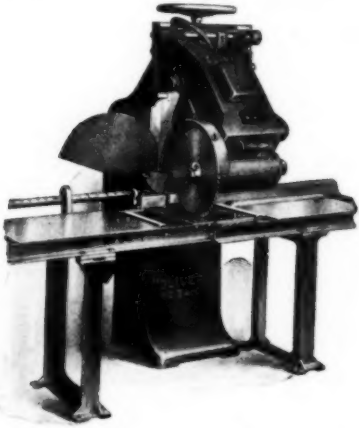
ATLAS PRESS CO., 750 N. Pitcher St. Kalamazoo, Mich.

Complete Displays at:

CHICAGO 35 E. Wacker Dr. **NEW YORK** 130 W. 42nd St. **PHILADELPHIA** 113 N. 3rd St.

Oliver Machinery Co. Announces a "Straightline" Cut-Off Saw

Illustrated here is the new Oliver "Straightline" cut-off saw for sawing metal tubing, moulding, strips of sheet metal and alloys, as well as composition and wood. This new machine uses the suspended accurate link motion, which is claimed to guarantee perfect straight line operation, so that the saw will make the cut and automatically return to its locked position with no chance for rebound.

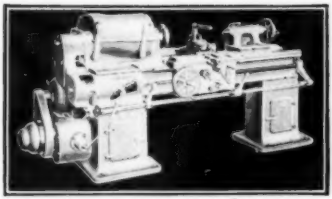


This Oliver machine, known as No. 94-D, is made in two models, one for straight cuts only at right angles to the length of the material, and the other with a swiveled column to make angular cuts up to 45 degrees right and 15 degrees left, pivoting on the line of the cut-off gauge.

The totally enclosed, fan cooled motor is mounted directly on the saw arbor, which is made of crucible steel, accurately ground to 1-inch diameter where the saw or cutting disc is attached. The arbor is fitted

(Continued on Page 26)

CHARD Twelve-Speed All Geared Lathes



Precision Timken or Plain Bearing Spindle.
Instantaneous Start or Stop of Spindle.
12 Speed Changes in 15 seconds.
Heat Treated and Hardened Gears run in Oil in Speed Box.
All Shafts mounted on Ball Bearings.
Powerful, Accurate, and Easy Control.
Built in 16", 18" and 20" Standard Engine Lathes, Manfacturing Lathes and Tool Room Lathes.

Send for complete catalog No. 100.

DEALERS: *Write for dealer proposition.*

Western Machine Tool Works, Holland, Mich.

RED HEAD

COMBINATION ETCHER and DEMAGNETIZER

Ask the man who uses one.

Non-welding, non-sticking alloy point. Four adjustments for etching depth. Uses standard 110-volt, 60 cycle A. C. current.

SEND FOR CIRCULAR

Taylor Sales

2832 E. Grand Blvd., Detroit, Mich.

with large collars and will carry dado heads or grinding wheels up to 18 inches wide.

Power is supplied by a 5 h. p., 2 or 3 phase motor on 60 cycle, 220 or 440 volt current. Motor bearings are anti-friction, pressure gun lubricated. For unusually heavy service, a larger motor can be used.

As a safety feature, the saw with its guard is built to be housed inside the main column when not in use. A saw guard and a dust chute to connect to the exhaust system are standard equipment.

The machine will carry circular saws, cutting discs, bonded wheels, dado heads, or solid cutters or grinding wheels from 10 inches to 18 inches in diameter. The entire suspended mechanism is carried by a yoke with gibbed way, vertically adjusted by handwheel and screw with 3-inch vertical adjustment, to compensate for wear in saws or the use of saws of different diameters.

Light gauge steel sections having maximum height up to 4½ inches may be cut off with the 18-inch metal saw. Light sections 2 inches high and 20 inches or less wide can be cut easily. Some models are specially built with larger motors to take cutting discs up to 20 inches in diameter.

Detailed information may be obtained by writing to the Oliver Machinery Company, Grand Rapids, Mich.

New Catalogs are Available on Garvin Tappers and Steptoe Shapers

Two catalogs just issued by the Western Machine Tool Works give complete information on the Big 4 line of shapers and tapping machines.

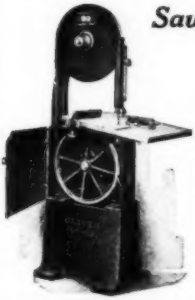
Each of the catalogs, which are attractively printed in color, contains 24 pages of information dealing with new improvements and is fully illustrated with large photographs, detailed drawings and blueprints.

Garvin single and multiple spindle tapping machines are made in both vertical and horizontal models with a variety of motor and pulley drives and a four change speed box.

Steptoe shapers are made in 14, 16, 20, and 24-inch models, single or back-geared, with motor or cone pulley drive and quick change speed box.

Copies of either catalog may be obtained by writing to the Western Machine Tool Works, Holland, Mich.

"OLIVER" BAND SAW



Saws sheet steel with greatest of ease

- **Precision-built throughout**
- **Motor-on-shaft**
- **Operates from light socket**

This "Oliver" 18-inch Band Saw has all the refinements developed for larger "Oliver" Band Saws. It's especially effective in sawing sheet steel. Also sprues of soft metal, ply-metal, hard rubber, compositions, wood, etc.

Rips to 11 inches wide. Cross-cuts and miters up to 8 inches. Table tilts 45° to right. It's a sturdy, precision-built machine in every detail.

- ***Write for descriptive folder***

OLIVER MACHINERY COMPANY
GRAND RAPIDS, MICHIGAN

---

2 INSTRUMENTS IN ONE . . . AT ONE LOW PRICE!

★

FRAMPTON
Portable

DEMAGNETIZER and ETCHER

Weighs only 16 lbs. yet as effective as much larger and costlier stationary models. Carry it to the job—instead of carrying the job to it!

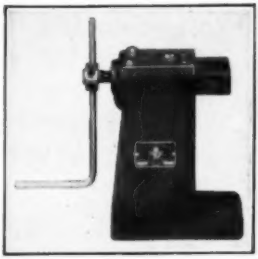
DEMAGNETIZER works swiftly on any job. Demagnetizes completely. Can also be used to magnetize small tools, etc. **ETCHING PENCIL** labels any tool or die of any thickness. Three voltages: Low, Medium, High, allowing 3 steps to prevent burning thinner pieces. Complete with all ground cords, etc., assembled in attractive case with Veri-Chromed bakelite panel. Plugs into any 110 volt, 60 cycle line. Hundreds of enthusiastic machine shop users. ***Write for Complete Details Today.***

Only $50. Complete

Frampton Electrical Equipment Co., 42 Norwood Power Bldg., Dayton, Ohio

New Haskins Vise Fixture

To meet present requirements for accuracy in high speed tapping and drilling as well as in other operations, the R. G. Haskins Co., Chicago, has developed what is known as the Haskins No. 602 vise fixture.



The maker claims it is simple to operate, easy to use and permanently accurate. The 3-point contact jaws are made of hardened tool steel, with five combinations of jaws for handling round stock from $\frac{3}{16}$ to 1 inch in diameter. The handle can be adjusted to any position. It is necessary to move the handle only 30° to release a part.

The vise base is provided with a T bolt and slot for mounting on the machine work table. Further information on sizes or uses may be obtained directly from the R. G. Haskins Company, 4654 W. Fulton Street, Chicago, Ill.

Chicago Wheel Co. Issues Booklet for Home Basement Craftsmen

Men who spend evenings and Sundays tinkering in the basements of their homes with models of ships and airplanes, carvings in wood and metal and homecrafts of all kinds, especially modelling in miniature, will enjoy an instruction book issued by the Chicago Wheel and Manufacturing Company, Chicago.

The 32-page booklet, called "Pleasure and Profit with the Handee", illustrates the uses of the Handee grinder in drilling, polishing and grinding fine work of many kinds, and contains diagrams, photographs and tips on the construction of a home lathe and other wood and metal-working tools.

Modelmakers will be interested in the descriptions of the home-made pantograph, saw table and router and

(Continued on Page 30)

Do You Need a "Mike"?

BEFORE YOU BUY SEND FOR BOOKLET "B"

SWEDISH GAGE MICROMETERS HAVE HARDENED, GROUND AND LAPPED LEAD SCREWS.

ACCURACY DEFINITELY GUARANTEED.

OTHER EXCLUSIVE REFINEMENTS.

SWEDISH GAGE CO. OF AMERICA

7300 WOODWARD AVE., DETROIT, MICH.

Send for this BULLETIN

Just off the press. It gives in handy tabular form the horse power ratings at 100 to 1800 R. P. M. on each of eight sizes of ABART Straight Line Spur Gear SPEED REDUCERS geared for all standard ratios from 2-1 to 20-1. Sizes up to 400 horse power.

GEARS

of all types and materials—accurately machined—promptly delivered. Send specifications for estimates.

Abart GEAR AND MACHINE CO.
MANUFACTURERS OF
Speed Reducers & Gears
4832 WEST 16TH ST. CHICAGO ILLINOIS

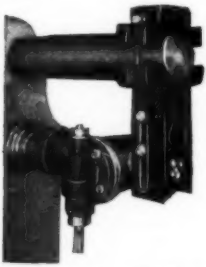
in the chapters written concerning the modelmakers' art, while men interested in practical construction and maintenance work around the home will find helpful hints in the chapters on automobile repairing and on soldering and mending.

Carving jewelry and ornaments of various synthetic materials is a popular occupation among home craftsmen, and those who find enjoyment, and often profit, in making cigarette boxes, ash trays, cosmetic boxes and rings or clasps of glass, cast resin or any of the new molded plastics will find helpful information and diagrams in the section of the book devoted to art work.

A copy of the book may be obtained by writing to the Chicago Wheel & Manufacturing Co., 1101 West Monroe street, Chicago, Ill., and asking for "Pleasure and Profit with the Handee".

Able Products Milling Attachment

Extreme durability and a high degree of precision are features of the new vertical spindle milling attachment illustrated here. By simple adjustment of a sliding suspension support it can be made to fit any milling machine, with either right or left hand cutters.



An important advantage claimed for the new miller is that it can be used for drilling, boring or milling in any direction and at any angle without disturbing the set-up of the work. The attachment can be set in position by one man.

A Brown & Sharpe No. 7 taper is furnished with the miller as standard equipment, although other tapers will be supplied on request. Speed ratio is 2 to 1. Gears, quill and all nuts and bolts are hardened. The main spindle, which is precision ground, runs on S.K.F. ball bearings.

The attachment is being marketed by the Able Products Machine & Tool Works, Inc., 20 West 22nd Street, New York City, who will furnish additional information on request.

THIS GAGE MAKER KNOWS HIS GAGES ARE RIGHT

That's because he uses Johansson Gage Blocks. By selecting blocks of certain sizes and sliding them together he quickly forms a unit gage for precision measuring.

Johansson Gage Blocks may be purchased in sets or individually. Blocks of "B" quality are accurate within .000006 of an inch. Some cost as little as $3.50. We would like to send you Catalog No. 11.

JOHANSSON

GAGE BLOCKS AND ACCESSORIES

Manufactured, sold and serviced in the United States and Canada by

FORD MOTOR COMPANY

Johansson Div. Dearborn, Mich.

T. H. L. FRONT LEVER BENCH PUNCH

Malleable iron body; working parts hardened. Steel shaft and plunger. Die cannot lose alignment with punch. All parts interchangeable. Built for hardest, toughest work. Weight 70 lbs.

We can supply extra Punches at 20 cents each; extra Dies at 30 cents.

Capacity ½" holes through 3/16" steel; 13/32" through ¼" steel. Can also be made for up to ⅞" holes through thinner metal. Punches and dies in stock from ⅛" to ½".

Immediate shipment from stock

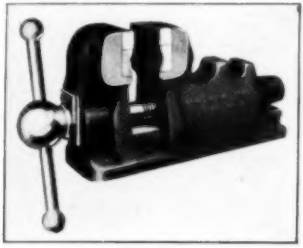
T. H. LEWTHWAITE MACHINE CO.

(Est. 1890)

311 E. 47th St., NEW YORK

Athol Vise for Heavy Pipe

Athol Machine & Foundry Co., of Athol, Mass., and Chicago, Ill., announce a new and improved heavy pipe vise especially designed to meet the needs of plumbers and steamfitters. This model, developed in consultation with engineers of a large eastern firm of piping contractors, has a number of new and exclusive features designed to meet the practical needs of handling various sizes of pipe.



Base and jaws are extra-heavy semi-steel castings, correctly proportioned to withstand the strains of steamfitter's work. The front jaw is fixed and the back jaw moves, a feature that allows long lengths of pipe to rest upon the bench. There is no need for blocking or special supports as is the case when a movable front jaw brings the pipe out beyond the edge of the bench.

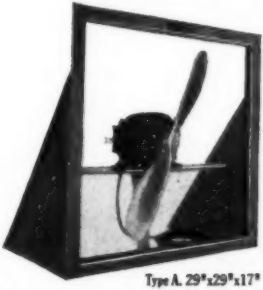
Large, deeply checked tool steel, flat jaw facings, with straight section for ordinary work, are provided. The special pipe grip sections have correctly shaped double-radius curves. Pipe of any size is firmly held, as the shape of the jaw facing assures contact at several points, instead of at only one point on the pipe as with the ordinary facings.

The exclusive Athol buttress thread screw is used in this new vise, and the screw is equipped with a removable nut. The buttress thread gives a full 50 per cent greater strength than a square thread of the same pitch. It is heaviest at the root, with its extra metal and extra strength just at the point where the strain is greatest.

Athol No. 1115 pipe vise handles pipe from ⅛ to 6 inches and has 5 inch jaw width. Weight is 137 lbs.

NEW! AIR BLAST FANS

Cool Workers Do Better Work



Type A. 29"x29"x17"

Delivers 5000 c.f.m.

Fans are equipped with SKF Ball Bearing Motors. Can operate in any position. High quality construction insures long life. Heavy wire guards $4.50 extra.

LOOK !!
At the Price

$29.60

110 V., A. C. F.O.B., N.Y.C.

Special introductory offer.

TWO WEEKS FREE TRIAL

Unconditionally guaranteed for 1 yr.

Chelsea Fan & Blower Co., Inc.
370 W. 15th St., New York, N. Y.

Moto-tool

does Many Tedious Jobs

The Dremel Moto-tool grinds, drills, engraves, sharpens, carves, polishes and does hundreds of jobs ***quicker, better*** and ***with greater precision.*** Its light 6 oz. weight gives perfect balance with the tool edge and perfect tool control. Less wear on tools. Handles easily as a pencil.

The Moto-Tool is surprisingly powerful and sturdy. 110 v. universal motor—about 20,000 R.P.M.——oilless, self-aligning and ball thrust bearings mounted in felt oil retainers. Handy built-in, off-and-on switch. Easily replaceable brushes. Universal collet chuck. Hardened tool steel replaceable spring collets. Efficient cooling system permits continuous use. Bakelite housing. You must see and use it to appreciate its ***tremendous value***

Only $9.85

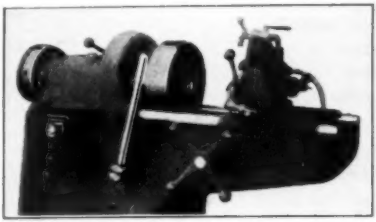
10-day TRIAL

Money refunded if not highly satisfied.
Write TODAY for free illustrated booklet.

DREMEL MFG. CO.
587 Ct., Racine, Wis.

New Chucks Improve Little Landis Pipe Cutter

To speed up still further pipe-cutting and threading operations with the Little Landis pipe-cutting machines, the Landis Machine Co., Waynesboro, Penna., has developed new front and rear chucks to center and support the pipe.



The rear chuck is of the three-jaw universal type, and provides for automatic centering of the pipe. Since it is not intended to grip tightly, no wrench is needed for tightening, and a knurled ring is provided for hand adjustments. The chuck can be applied to any 2-inch Landis machine now in use.

The new lever-operated front chuck must be built into the machine, and is supplied only with new equipment. It is graduated for all diameters of pipe from ¼ inch to 2 inches and can be adjusted for size within a few seconds by loosening only one nut.

New Circular Describes Lifters

Unusual mechanical lifters for hard-to-handle products for which standard handling equipment devices are not well adapted, are fully described and illustrated in a new circular issued by the Lewis-Sheppard Company, Watertown, Mass.

The circular shows specially engineered devices for lifting and moving reels of cable, refrigerators, rolls, drums, kettles, crated glass, tin plate, liquids, warp beams and various heavy products. Ask for circular No. 320.

ACE SPOT WELDERS

Cut Manufacturing Costs

Eliminate Bolts and Rivets

Engineered to meet the practical requirements of manufacturers, sheet metal and wire fabricators as well as machine and sheet metal shops. Built for continuous, fast production spot welding.

Write for illustrated circulars and specifications

PIER EQUIPMENT MFG. CO.
606 Cross Street, Benton Harbor, Mich.

HORAT HAMMERS

Made of Inexpensive Babbitt and Lead

Easy to Recast

Horat soft metal hammers save costly damage to finished metal parts and do not become hard with use. When your Horat hammer becomes dented, simply melt and recast it, using the Horat mold. Horat molds are made in five standard sizes—2, 3, 4, 5 and 6 lbs.

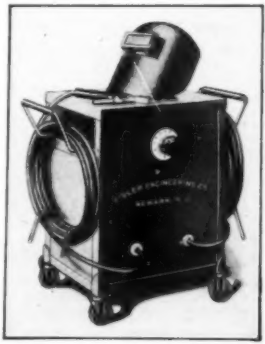
To make a Horat hammer, clamp the handle in the mold, melt one part of lead and one of 10-cent babbitt in the ladle, tilt the mold and your hammer is ready as soon as it's cooled. A handle of correct size is furnished with each mold.

See your dealer, or write

The HORAT MFG. CO., Lafayette, Ind.

Eisler Produces Three Arc Welders

Special, built-in air ducts assure natural ventilation of the transformers of a new line of portable and stationary a.c. arc welders now being manufactured by the Eisler Engineering company.



Temperature rise is said to be 31 degrees C., and the time of recovery from short circuit to 5% of normal to exceed not more than 2 cycles of 60 cycles, single phase current, conforming with NEMA standards.

The welders are being supplied in three sizes—40-200 amp., 50-300 amp., and 75-400 amp., with 11 and 21-point controls, and use electrodes $\frac{1}{16}$ to $\frac{3}{16}$, $\frac{3}{32}$ to $\frac{1}{4}$ and $\frac{1}{8}$ to $\frac{3}{8}$ inch respectively. They have been designed to eliminate the critical arc length maintenance and produce welds having, it is claimed, a tensile strength of 7500 pounds to the square inch.

Power consumption when the unit is not welding is 70 watts for the 200 amp. size and 100 watts for the 300 amp. size. Cost of operation on a 200 amp. stock welder is estimated by the maker at 9c an hour with a $\frac{3}{16}$ electrode on a 3c k.w.h. rate.

For complete information on the various sizes and models, write to the Eisler Engineering Co., Inc., 746 South 13th Street, Newark, New Jersey.

New Flame Cutter Saves Labor

Interesting among recent developments in new machinery is a flame cutter being manufactured by the Schoitz Tool, Gear and Machine Works, Waterloo, Iowa.

This new development, illustrated below, was produced to cut tool blocks, chuck jaws, face plates, die

(Continued on Page 38)

GEARS

Spur - Helical - Worm - Bevel - Miter, Etc.

Latest type of Hydraulic Operated Broaching Machine and Grinders.

We carry a large stock of spline and square broaches which on small orders saves you money.

Prompt service and quality has retained a large list of customers for 25 years.

The Taylor Machine Company

1919 E. 61st St., Cleveland, Ohio

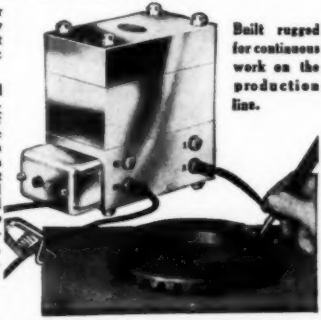
For Light and Heavy Etching

With 24 Stages of Control.

The LUMA Master Etchtool fulfills every marking requirement that can be done by an electric Etching outfit.

A Production Tool with as many as 24 different stages or varieties of control for regulating the depth of marking, this tool can be used for extra light marking of machinest scales, micrometers and fine tools or can be used or *extra heavy and deep* marking of rough and unfinished iron, cast iron, forgings, steel plates, etc.

Send for circular giving complete data and details of this modern Instrument.

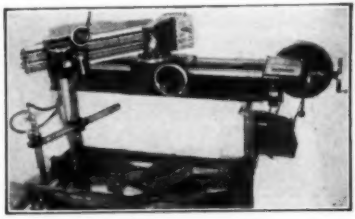


Built rugged for continuous work on the production line.

LUMA ELECTRIC EQUIPMENT CO.

DEPT. H.—Main P. O. Box No. 132—TOLEDO, OHIO

shoes and other pieces from solid bar and plate stock at what, according to the manufacturer, is a tremendous saving in time and labor cost. Time for cutting a die shoe for instance, is given in the Schoitz circular as 5 hours by machine and 14 minutes with the flame cutter.



The machine, which is driven by a ½ h. p. motor, cuts not only straight lines and angles, but bevels and circles. This last is claimed as a great advantage in cutting gear blanks, since it eliminates waste by cutting concentric rings and leaving the center portion undamaged. Edges, to judge from unretouched photographs and the manufacturer's statements, are straight, square and accurate.

The cutter will make longitudinal cuts up to 38 inches, with a cross travel of 17 inches and will cut circles from 3 to 36 inches in diameter in steel bar or plate stock from ¼ inch to 6 inches in thickness.

The manufacturer will send an illustrated circular on request.

Handy Pocket Manual On Fire Brick

The Standard Hand Book of Refractories, an attractive, pocket-size manual of information for engineers, plant superintendents and others interested in the control of heat, has just been published by the Standard Fuel Engineering Co.

Profusely illustrated with actual photographs of typical installations of a wide range of refractories, the 48-page booklet shows various methods of applying high-temperature cements and contains also some very useful tables of weights and measures of the many types of fire-brick used in industry.

Readers may obtain copies, without charge, by writing to the Standard Fuel Engineering Co., 667 South Post Avenue, Detroit, Michigan.

Sheldon Arbor Presses

Sheldon Milling Machine Vises.

Sheldon Drill Press and Shaper Vises.

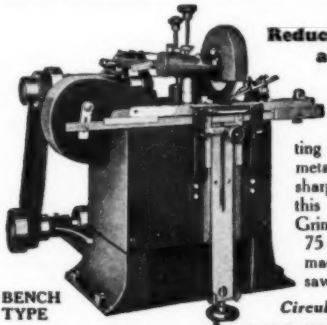
Sheldon 90° Angle Plates.

Write for illustrated price list.

Sheldon Machine Company

3255 Cottage Grove Ave., -:- Chicago, Ill.

WARDWELL MODEL E-C COMBINATION Automatic Saw Sharpener



BENCH TYPE

Shown With Hack and Band Saw Attachments

will

Reduce Saw Purchases and Increase Your Cutting Speeds

Power hack saws, metal and wood cutting band saws, all types of metal cutting circular saws, sharpened automatically in this improved Wardwell Grinder, at a speed of 30 to 75 teeth per minute. The machine accurately sharpens saws as fine as 32 teeth to 1".

Circular Free Upon Request

WARDWELL MFG. CO.

3165 Fulton Rd.: Cleveland, O.

New "Ideal" Electric Tool Marker Is Complete, Handsize Unit

A new and inexpensive portable tool for marking on practically any material, whether metal or non-conductor, is being introduced this month by the Ideal Commutator Dresser Co., 1441 Park Ave., Sycamore, Ill.

The Ideal marker is considered an improvement over other electric markers because of its compact design. It weighs only two pounds, is 6¾ inches long overall, and requires no cabinet, auxiliary controls, rheostat or transformers for operation.

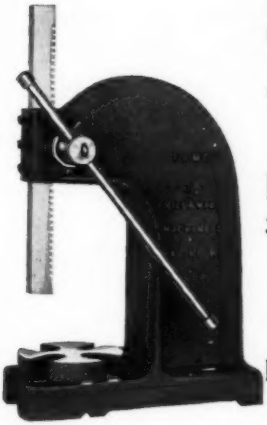
The point of the new marker does not stick into the surface of the material, but makes permanent lines, cut deep enough that they are not removed by ordinary wear in handling. The instrument is especially useful in marking the owner's name on tools or equipment, in writing stock numbers, sizes or trade names on all metals and alloys, glassware, pipes, rubber, bakelite and plastics, fibre and similar materials.

Power consumption is estimated at 75 watts on 110 volt, 60 cycle alternating current. The marker can be furnished also for other standard voltages and frequencies, and comes complete with cord, plug and switch.

New Data on Speed Reducers

The Abart Gear & Machine Company has just issued new bulletin No. 1200, which gives new engineering data on their straight line drive spur gear speed reducers, type CA, in ratios up to 20 to 1.

Tables of horsepower rating and input r.p.m. should be very interesting to manufacturers. This bulletin contains complete data in a very convenient form. A copy may be obtained by writing to the Abart Gear & Machine Company, 4832 W. 16th Street, Chicago, Ill.



HIGHER QUALITY **FAMCO** LOWER PRICES

ARBOR PRESSES

½ to 12 tons

FOOT (KICK) PRESSES

3 in.—6 in.—10 in.

AT YOUR DEALER'S,
Or Write for
Descriptive Literature to

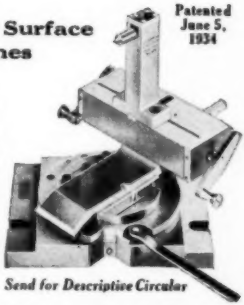
Friis & Miller Machine Co.
RACINE, WIS., U. S. A.
(Manufacturers)

The Vinco Angle Tangent to Radius Dresser

For

External, Internal and Surface Grinding Machines

Based on its merit the Vinco Angle Tangent to Radius Dresser deserves to be standard equipment in every grinding department. It will save you 75% in dressing costs and eliminate all your worry and uncertainty in dressing angles and radii tangent to each other on abrasive wheels. It is precision made of the finest materials; all parts subject to wear are hardened, ground and lapped. It is the only angle tangent to radius dresser on the market, made and sold under our basic patent. It is fully guaranteed to be satisfactory.



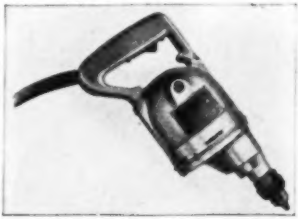
Patented June 5, 1934

Send for Descriptive Circular

VINCO TOOL CO., 7348 Central Ave., Detroit, Michigan

Signal Co. Improves Standard Drill

A new and improved standard-duty portable electric drill is announced by the Signal Electric Manufacturing Company, Menominee, Michigan, manufacturers of electrical appliances.



The new drill, known as model OB-4 and illustrated here, has a capacity of ¼ inch, the same as the other Signal standard-duty drill, but differs from it in having the cord and switch in the handle, which is ventilated. This drill is powered by a Signal universal motor, for direct or alternating current, and is made of durable aluminum alloy. Gears are made of a special alloy, heat treated. The almond 3-jaw chuck is operated with a key.

Speed is listed at 1700 r.p.m. without load. The unit is furnished complete with eight feet of heavy duty, rubber covered cord and a rubber plug.

Landis Collapsible Tap Uses Pilots

The Landis Machine Company, Waynesboro, Pa., recently marketed a collapsible tap of interesting design which employs pilots to insure concentricity of the thread being tapped with the other parts of the casting.

The illustration shows a set of these pilots applied to a style LT tap designed for tapping the bottom of a deep hole in a cast steel tractor part. The pilot ahead of the chasers lines up the tap with the bore of the hole. The rear pilot, made in the form of a collar, fits a reamed hole near the top of the casting with which it is necessary to maintain concentricity. Both pilots are made of steel, hardened and ground, and revolve with the work in order to prevent seizing.

Similar pilot arrangements can be furnished with Landis collapsible taps in all sizes from 1⅜ inches to 12 inches, inclusive.

ALLIGATOR
TRADE MARK REG. U.S. PAT. OFFICE
BELT CUTTER

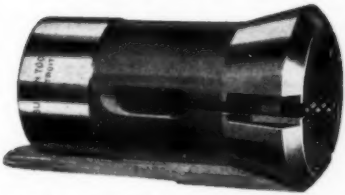
By the makers of Alligator Steel Belt Lacing

You simply PUSH the knife through the belt. Makes a clean, square cut of any belt (except metal stitched) up to 8 in. wide. Combined guard and hold-down clamp holds belt immovable. Knife will make several thousand cuts and is readily replaceable. Used as illustrated or horizontally. Weight 4 lbs. and 3 ozs. net. Order through your distributor. $10.00 in the U. S. A.

Sole Manufacturers

FLEXIBLE STEEL LACING CO.
4670 Lexington St., Chicago
In England at 135 Finsbury Pavement, London, E. C. 2

Self-Adjusting and Diamond-Serrated Pads Hold Hot-Rolled Stock



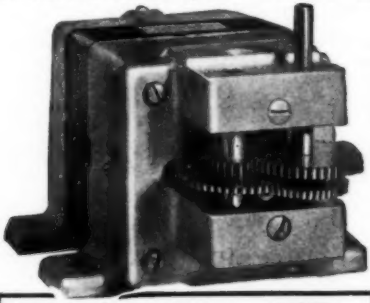
Sutton
Diamond Grip Compensating
Collets

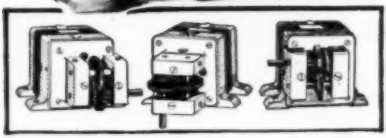
● **Grip positively under ⅓ to ½ less tension than required for ordinary master-type collet. Diamond-Serrated pads adjust themselves to hot-rolled stock. Also furnished with pads for cold-rolled. Pads interchangeable and replaceable. Completely listed in No. 12 Sutton Catalog.**

SUTTON TOOL CO., 2836 W. Grand Boulevard, DETROIT, MICHIGAN

New Speedway "Flea Power" Motor

A new "flea power" worm-drive back-geared motor that can be assembled with drive shaft to right or left, up or down, is announced by the Speedway Manufacturing Company. The new assembly, it is claimed, greatly simplifies mounting problems and eliminates the need for complex and angular drives.





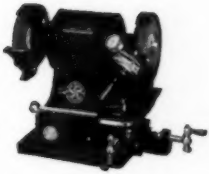
An improved worm drive on the primary reduction and straight, wide faced, cut steel gears on the final reduction result in unusually quiet operation. A wider range of selected speeds is provided on the final shaft. The unit illustrated above has for standard speeds 1, 7, 11, 40 and 80 r.p.m., with many other speeds available.

Units may be obtained in A.C., D.C. or universal types. The motors are extremely small in size, measuring only 2½x3x4 inches, including the reduction gears, and are totally enclosed. The gears are the only moving parts left exposed. Standard shafts are $\frac{3}{16}$ inch round, but may be obtained in other sizes. High starting torque and low input of 4 to 15 watts are claimed as additional advantages.

Complete information may be obtained directly from the Speedway Manufacturing Company, Cicero, Ill.

STAR ★
Precision
Drill Grinder

Grinds 81 Sizes
No Attachments



Save 50% of drilling cost with a Star Precision drill grinder. A Star grinder will keep 81 sizes of drills sharp and accurately ground, including 25 fractional sizes from ⅛ to ½", without collets, backstops or extras. Power is furnished by a 110 or 220 volt AC or DC motor at 3600 r.p.m.

Anyone can learn in half an hour to operate a Star Precision drill grinder. Save extra reaming and work rejected because of oversized holes by keeping your drill equipment accurate, efficient and always in first class condition.

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★ STAR Machine & Engineering Corp.
Bloomfield, New Jersey

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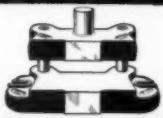
BAUMBACH

AT LOWER COST



24 DIFFERENT STYLES

OVER 95,000 SIZES

STANDARDIZED DIE SETS

Semi-Steel

Drop Forged Steel

Send For Our New 208 Page Catalog

E. A. BAUMBACH MFG. CO.
1810 South Kilbourn Ave., CHICAGO, ILLINOIS

New Stanley Electric Drill

A new electric drill, the "Victor No. 114," light in weight and compact in size, has been added to the line of Stanley electric tools.

The "Victor" was designed especially for plumbers, electricians and mechanics and fits easily in a tool kit.

The drill measures 12 inches in length, weighs only 5¼ pounds and has a capacity up to ¼ inch in steel. The universal type motor operates on either d.c. or a.c. current at 60 cycles or less at a load speed of 1400 r.p.m. The 3-jaw chuck is built for heavy duty.

The motor housing and handle are cast in one piece from a strong aluminum alloy, and the rocker motion switch is located in the handle. Additional information may be obtained from the Stanley Rule and Level Plant, New Britain, Conn.

Williams Reversible Ratchet Wrench

J. H. Williams & Company, 75 Spring Street, New York City, announce a new line of heavy duty reversible ratchet wrenches to be known as "Superector".

These wrenches embody several unique structural and design features which are distinct improvements in this type of tool. Outstanding among them are quadruple pawls, instead of the usual two, which provide double bearing and strength with greatly increased durability. Handles also are drop forged instead of being cast, to utilize the extra strength afforded by the pawls.

Built for rapid operation in the most severe service in bridge construction, structural building and other work requiring strong, fast-acting tools, the new Williams "Superector" is made in five large sizes from 24 inch to 48 inch, each fully guaranteed. Both hexagonal and square sockets have the hole extending clear through, with openings from 1 1/16 to 4 5/8 inch, so that they will turn nuts on bolts of any length.

1905 Strand 1936

TYPE M5—
¼ H. P.

YES

We Welcome Most Heartily A Comparison in Quality

OF

Flexible Shafts

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Machines

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MANUFACTURERS
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Riveters--Pioneers

in their line—Head rivets from smallest to ⅝" diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—Types include Vertical and Horizontal Multiple Spindles.

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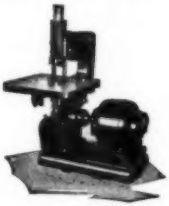
C. E. Station, Bridgeport, Conn.

OLIVER of ADRIAN
Die Making Machines

—save 50 to 60% of the labor on all sawing, filing and lapping operations. Saw to the die outline from advantageous starting points, thereby eliminating unnecessary sawing.

No saws to braze or special parts to buy.

Machines available for all classes of work in materials up to 3" thick and at a price within the reach of every shop.



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Often Used on MILLER, SHAPER or PLANER

With and Without Jig Attachments
Made In Three Sizes,—Jaws 6", 9" and 12" Long

Bushings interchangeable. Any Size Up To 1 1/16"

Saves Jig Making

Good as a Plain Vise

Understand And Buy It

10,000 Sold, for a Reason

Fig. 1. With Jig Attachments.

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STOP Your Losses

with a Walton Tap Extractor

Remove that broken tap quickly—*without* injury to the threads.

About 90% of all taps break before they wear out. Each broken tap means stopped production, and the loss of a mechanic's valuable time. Decrease time spent on extracting broken taps and increase production. You can do it with a Walton Tap Extractor.

Made in three and four-flute styles.

A 60 day free trial will convince you

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95 Allyn St., Hartford, Conn.

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2, 3 and 4 Way Valves

Flat Disc Type

Style E
For pressures up to 300 lbs.

Made in Lever, Foot, Solenoid, Motor and Diaphram operated types that are guaranteed to hold tight. Adapted for operating single and double-acting cylinders using air, steam, oil or water.

Bulletin on Request

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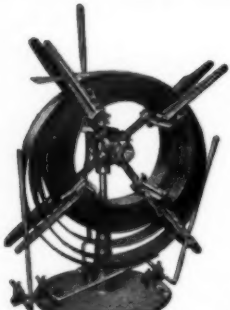
THE STANDARD "SOFT" HAMMERS of INDUSTRY

. . . preferred for the smooth, 1-piece heads, their power, balance and striking accuracy...*preferred* for their tougher (compressed water buffalo hide) inserted faces that hold their smooth surface, last far longer and are easily replaced. Standard in the greatest plants for die-setting, assembling and maintenance these superior "Soft" hammers come in many weights and sizes, with coiled Rawhide Mallets for light work and mighty Mauls for the heaviest.

Chicago Rawhide Mfg. Co.
1282 Elston Ave., Chicago, U.S.A.

Chicago Rawhide Hammers



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Littell Automatic Centering Reels enable one man to load and center heavy coils in less than two minutes regardless of the difference in inside diameters between one coil and the next. Centered coils turning on ball bearings revolve with the greatest of ease. This condition means greater production for both hand feeding and automatic feeding of coiled stock.

Write today for circular No. 5

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Mfr's of Punch Press Feeds and Reels

Hard Usage Doesn't Phase The

Hartford Milling Vise

Because it was designed to "take it"—and it does! It will stand up, day after day, under the heaviest, toughest strain of production milling work. Made of the best materials, with all parts interchangeable, it will outlast four or five ordinary vises. Rapid and accurate in operation—the top eccentric handle gives tremendous binding force, while the lower cam-faced handle gives instantaneous quick-opening and return. A trial in your shop will convince you better than anything we might say.

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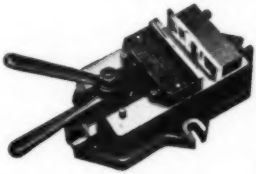

Jaw width	**5"**
Jaw depth	**1¼"**
Maximum opening	**3½"**
Weight	**40 lbs**

Also made in the swivel-jaw type with hard or soft jaws, maximum opening 2¼".

We also Build Machinery on a Contract Basis, Design and Develop Special Automatic Machinery—Gears and Cams Cut to Order.

Hartford Special Machinery Co., 285 Homestead Ave., HARTFORD, CONN.

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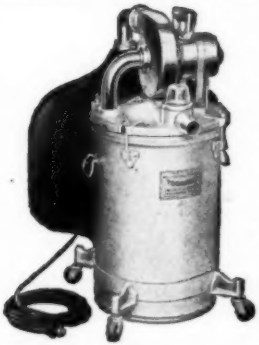
LOW COST PLANT CLEANING



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Great Cleaning power (46¼" water) ft) combined with light weight (only 40 lb) and sturdy construction make it possible to clean floors, walls, ceilings, overhead pipes, machinery, etc. at less than ½ the cost of other methods. Also ideal for salvaging metal dust, filings, etc. Motor unit easily detached for blowing.

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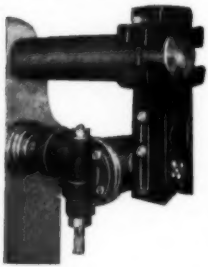

Furnished with No. 10 Brown & Sharpe Taper

S. K. F. Double-row Ball Bearings

The ABLE rigid, ball-bearing drive, vertical-spindle milling attachment fits any milling machine by means of an adjustable-slide suspension support. It can be used for milling, drilling and boring at any angle and in both directions without disturbing the set-up of the work. The main spindle, which is precision-ground, runs on S. K. F. ball bearings with Brown & Sharpe No. 7 taper. Speed ratio is 2 to 1. Motion is reversible for left hand cutters. All nuts and bolts are hardened. Price, $150.

We also manufacture the ABLE universal swivel vise

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STURDY
83½ lbs. Net Wt.

Built for Heavy Duty

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One year guarantee.....

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Yet Out of the Way with

HANDIEST RACKS

Shipped on free trial
Send for a set today

Neat, orderly arrangements of bar stock, pipe and shafting piled beside a machine on HANDIEST RACKS save space in the shop and time lost in looking for the right material. There's no need for pawing through heaps of heavy stock. Keep it out in plain sight on HANDIEST RACKS. Avoid running short of material. By using HANDIEST RACKS you can tell at a glance just when your supply of a certain stock is running low.

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CHEAPER, BETTER and FASTER!

They will cut costs in every industry

The same power unit used for grinding, can also be used for sanding, buffing. and polishing. There is a size and type with a specific tool for every requirement.

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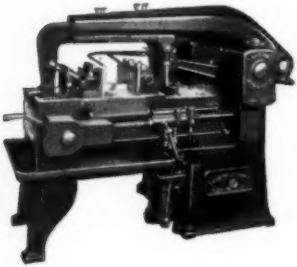
10x10", 12x12" 10x16" and 12x16" Capacities



Heavy Duty Machines for bar steel, die blocks, structurals, etc.

Full Hydraulic Control.

Easy Operation through single lever.

Three speeds for full range of steels, including alloys, tool steels, high speed and stainless.

Consistent, dependable performance at cutting rates never before obtained on reciprocating power saws.

Full line of sizes and types.

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Speed Lathes

"Timesavers for your plant"

Ideal speed lathes are especially recommended for grinding, lapping, and finishing small parts where a high production rate is desired with the greatest economy. These lathes can readily be adapted with collets or step chucks to handle at a low unit cost any work requiring speed and economy.

If your problems are unusual, let us show you how Ideal lathes can increase speed and produce greater economy in your plant.

Send today for circular 351

THE SCHAUER MACHINE CO.
9TH & BROADWAY, CINCINNATI, OHIO

A Heavy Duty VALLEY Ball Bearing ½ H. P. BENCH GRINDER AT $35.00

Full ½ H. P. motor 3450 R. P. M. Oversize Ball Bearings mounted in dust tight housings. Repulsion-Induction Single Phase Motor (Not Split Phase). Can be attached to any light socket. Fully guaranteed.

Equipped with two 7" dia. x 1" face wheels (Not the usual ¾" face wheels). Substantial base with cord and plug and switch in base.

VALLEY ELECTRIC manufactures a complete line of Bench, Pedestal type Buffers and Grinders. ¼ H. P. to 7½ H. P.

VALLEY ELECTRIC CORPORATION ST. LOUIS, MISSOURI

***Mfrs.* of Ball Bearing Motors ¼ to 40 H. P.**

DRILLING MACHINES

SIZES

Stationary Head—14"-20"-21"

Sliding Head — 24"-28"-32"-36"

These machines were formerly manufactured by the Rockford Machine Tool Company of Rockford, Illinois. Thousands of these machines have been installed and are giving universal satisfaction.

Also manufacturers of the Cleereman Automatically Oiled, Anti-Friction High Speed Drilling, Boring and Tapping Machines.

Builders of drilling equipment for over twenty years.

CLEEREMAN MACHINE TOOL COMPANY

Green Bay, Wisconsin

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"Produce More"
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Today's successful men are those who will not tolerate waste, those who find profits in what others call "overhead", those who standardize on **ARMSTRONG TOOL HOLDERS** and "Save All Forging, 70% Grinding and 90% High Speed Steel" on every operation, on all lathes, planers, slotters and shapers. They have learned that the right Armstrong Tool Holder will invariably cut cutting-cost, will be a strong, efficient tool and fit perfectly into their tool scheme.

Straight Shank Turning Tool

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Right-Hand Off-Set Side Tool

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"The Tool Holder People"

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Portable GRINDERS

Does a Hundred Jobs Well

Priced within range of every shop still built to industrial standards, the SpeedWay Type 123 Grinder is the lightest, handiest, most serviceable grinder built for all around use—for both precision and touch-up work. Does a hundred jobs well both as a hand tool and on lathes. Powerful motor operates on both AC and DC—takes up to 1¼ inch wheels. All aluminum construction. In case with collet, wrench and 3 grinding wheels.

SpeedWay Manufacturing Co., 1822 So. 52nd Ave., Cicero, Ill.

MARSCHKE

GRINDERS AND BUFFERS

Built for years of dependable service, in sizes to meet every industrial requirement. Grinding wheels are from 10 inches to 30 inches in diameter; motors are from 1 to 25 horsepower.

Marschke grinders are made in all styles and types.

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No. 1 Vise

Price $18.00

Made of Malleable Iron.
Tool steel jaws with "V" grooves and accurately ground.

Length over all	12"	Depth of jaws	2"
Width	4½"	Jaws open	3½"
Height	4"	Weight	18 lbs.

We also manufacture larger vises

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J. E. Martin Tool & Die Works

518 W. State St., Springfield, Ohio

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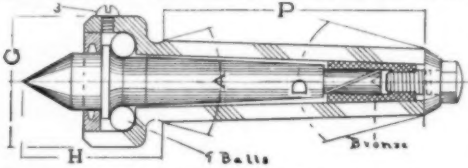

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Note its Dearth of parts and Self-evident Functions. Springless, yet inherently Resilient. Races integral and immovable. Shortest Overhang, but long spindle and most Accurate. Smallest head, but largest Balls. Heaviest Duty, but lightest Runner.

Threadless housing, but thread-bound Assembly within. Construction obvious. Terms, 30 days.

After 6 years, not one has ever yet broken down, or gone to junk.

Rigid Tool Holder Co., 12281 Turner Ave. Detroit, Michigan

OUTSTANDING TOOL VALUES

6½" Wide
18" Long

Also made in
8"x24" and 10¾"x37" sizes.

L-W MAGNETIC CHUCK

Waterproof for wet or dry grinding

A magnetic chuck that is adaptable for any purpose where a "real" chuck is required. Unconditionally guaranteed to furnish the highest magnetic holding power on either 110 or 200 volt direct current.
An Outstanding Value **$60.00**

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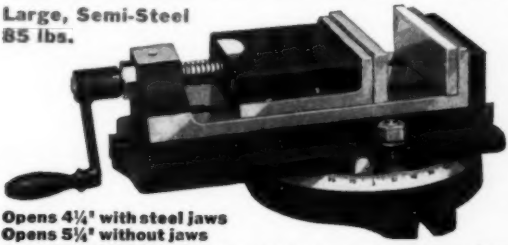
Swivel MILLING MACHINE VISE

Large, Semi-Steel
85 lbs.



Opens 4¼" with steel jaws
Opens 5¼" without jaws

A large, durable, semi-steel vise suitable for drill press, milling machine or shaper. Hardened steel jaws are 6½ inches wide, 2 inches deep. Can be used plain or swivel. Graduated base. Steel 1-inch acme screw. Shipping weight 90 lbs. **$29.50**

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Unmatched performance—a sensation wherever used, in experimental laboratory, model and tool room, on the production line in large and small plants—making, shaping, polishing all metal products, alloys, glass, composition materials, wood, stone, etc.

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This portable pump and tank combination is a complete pumping unit, always ready for use. Gusher pumps need no priming, have no valves or gears and are so constructed that chips and abrasives pass through them without injuring the mechanism. Centrifugal seal eliminates packing. Ball bearing motor mounted safely above the water line delivers a steady, high volume at low pressure. Elimination of piping and extra valves and parts makes the Gusher simple to operate and easy to keep clean. Heavy duty casters are optional.

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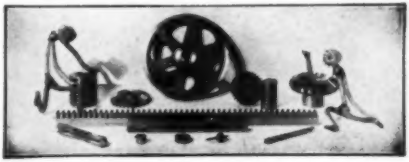

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MEDIUM SIZES IN ALL TYPES
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Acme Drill Jig Bushings are a standardized product, carried in stock for prompt delivery in over 6,700 standard items. They are completely finished and ready for use. The Bushings are made by the most exacting scientific methods, which insures long wear, accurate fit and absolute satisfaction. Special sizes made to order.

Send for our Bulletin, which gives complete details, sizes available, and low prices.

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CUT END MILLS

Send for a new catalog showing other sizes and styles

PROGRESSIVE TOOL & CUTTER CO.
FERNDALE, MICHIGAN

Beverly Throatless Shear

Cuts Sheet Metal To Any Shape

Straight-Circular-Irregular

Two Sizes—No. 1 weighs 16½ lbs., cuts up to 14 gauge. No. 2 weighs 32 lbs., cuts up to 10 gauge.

Priced low—Send for free circular

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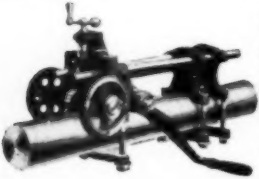
BURR Portable Keyseaters



Indispensable for repair and maintenance work. BURR keyseaters mill keyways in the run or on the ends of shafts while they are still on the machine—accurately, quickly, economically—and save the necessity of taking down large shafts and housings. Made in 7 sizes, hand or power driven.

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429 Kent Ave., Brooklyn, New York

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F. W. PALLANT, GEN. MGR.

Largest in **Cincinnati**

1000 ROOMS WITH BATH *from* $2.50

Represented in CHICAGO *by* Harry McEvoy, Hotel Sherman
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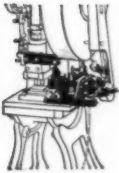

Speed up punch press production

Triple your Punch Press Production at low cost. Feed ***automatically*** any stock from coils in lengths from 0" to 24" per press stroke. Save time, operating costs and dies. ***Accurate*** —reduce scrap to a minimum. Types for every requirement—Single Roll, Double Roll and Compound type with straightener

WITTEK
High-Speed
ROLL FEEDS

WITTEK Reel Stands

Automatic Self-Centering, Ball-Bearing or plain. Adjustable to any height, balanced at any angle, 500 lb. capacity. Prompt deliveries from stock.

WITTEK
Universal
REEL STAND

WITTEK MANUFACTURING COMPANY
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THE E-Z THREAD DIAL

The E-Z Thread Dial is a device to facilitate thread cutting on engine lathes. It can be attached to any size and most makes of screw cutting lathes. The operator need not worry about "running by" or spoiling the work as he can stop the cut when and where he desires. It makes a hard job easy.

The lathe need not to be stopped nor reversed until the thread is finished. Also permits increased speed, due to certainty of stopping at the desired point.

The many repeat orders have demonstrated its worth.

Made in four sizes, to attach to any make of screw cutting lathe.

Sent on 30 days' trial. Give number of threads on lead screw; state if square, V or Acme thread, right or left hand, and give distance from top of carriage to center of lead screw.

JAMES A. COLVEN
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"Super" Speed Air Grinder

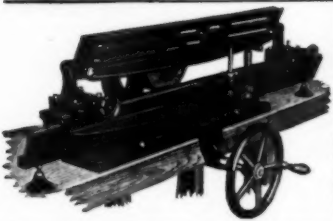
Speeds of 35,000 to 100,000 r. p. m.

Revolutionary in hand grinder performance! The M-B Super Speed air grinder operates on air pressures of 45 to 100 pounds, has amazing power and extremely high speed, yet weighs only 8½ ounces.

Write today for full details.

Desirable territories are open for dealers.

M-B PRODUCTS 130 E. Larned St., DETROIT, MICH.



Rogers Shear Blade Grinder

A bench machine for light blades. Also make floor type machines for blades up to 156" long. Sharp knives increase your cutting capacity. Write for bulletin H and specify length of blades.

Samuel C. Rogers & Co.
181 Dutton Ave., Buffalo, N. Y.

Bargain Micrometer Set

$11.95

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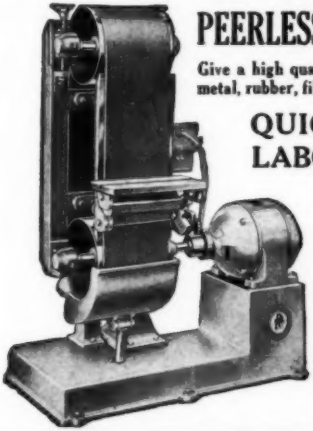

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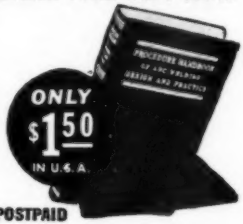

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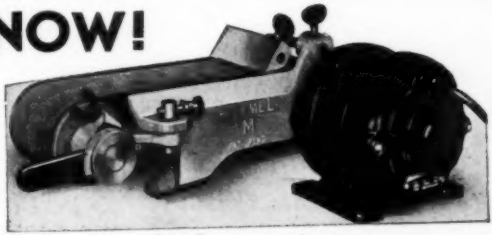

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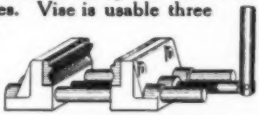

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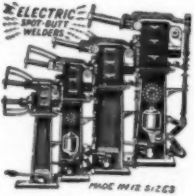

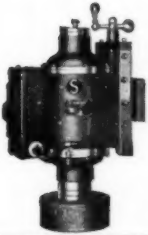

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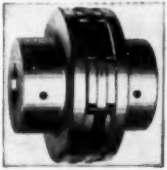

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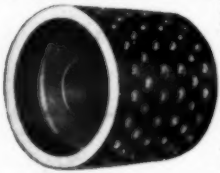

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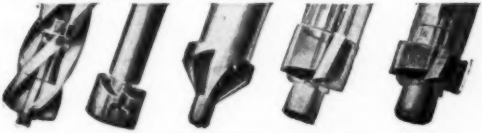

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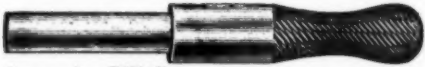

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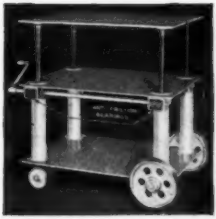

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Strand Co., N. A., 5601 N. Lincoln St., Chicago
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Grinding Machines, Ring Wheel
Standard Elect. Tool Co., Cincinnati, Ohio

Grinding Machines, Shear Blade
Rogers & Co., Samuel C., Buffalo, N. Y.

Grinding Machines, Surface
Gallmeyer & Livingston Co., Grand Rapids, Mich.
Standard Electrical Tool Co., Cincinnati, O.
Rogers & Co., Samuel C., Buffalo, N. Y.

Grinding Machines, Tap
Gallmeyer & Livingston Co., Grand Rapids, Mich.

Grinding Machines, Universal
Gallmeyer & Livingston Co., Grand Rapids, Mich.

Grinding Wheels
Chicago Wheel & Mfg. Co., M.C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Grinding Wheels, Mounted
Chicago Wheel & Mfg. Co., M.C. Tool Div., 1101 W. Monroe St., Chicago, Ill.
Dremel Mfg. Co., Racine, Wis.

Grinding Wheels On Shanks
Chicago Wheel & Mfg. Co., M.C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Hack Saw Blades
Armstrong-Blum Mfg. Co., 941 N. Francisco Ave., Chicago

Hack Saw Machines
Armstrong-Blum Mfg. Co., 941 N. Francisco Av., Chicago

Hammers, Mallets and Malls
Chicago Rawhide Mfg. Co., 1250 Elston Av., Chicago, Ill.

Hammer Molds
J. Horst Mfg. Co., Lafayette, Ind.

Hammers, Soft Metal
J. Horst Mfg. Co., Lafayette, Ind.

Hand Saws, Portable Electric
Stilsaw, Inc., 3304 Elston Av., Chicago, Ill.

Hand Screw Machines, Precision Bench Type
Hardinge Brothers, Inc., Elmira, N. Y.

Hangers, Ball, Roller and Babbitt
Passman Bros., 705 W. Washington Blvd., Chicago, Ill.

Heads, Boring
Flynn Manufacturing Co., Detroit, Mich.

Hole Cutters
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Hollow Adjustable Mills
Gairing Tool Co., Detroit, Mich.

Index Centers
Wm. Carroll & Son, Norwood, Cincinnati, O.

Jigs and Fixtures
American Tool Works, Inc., Hartford, Conn.
Hamilton Tool Company, Hamilton, Ohio
Hartford Special Mchy Co., Hartford, Conn

Keyseating Machines
Burr & Son, John T., Brooklyn, N. Y.

Knurls and Holders, for Turrets
Graham Manufacturing Co., Providence, R. I.

Lacing, Belt
Flexible Steel Lacing Co., 4670 Lexington St., Chicago, Ill.

Lamp Guards
Flexible Steel Lacing Co., 4670 Lexington St., Chicago, Ill.

Lapping Machines
Hack Universal Die Making Machine Co., 440 N. Oakley Blvd., Chicago, Ill.

Lathe Centers
Rigid Tool Holder Co., Detroit, Mich.

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Drilling Machines, Radial
Western Machine Tool Wks., Holland, Mich.

Drilling Machines, Sensitive
Atlas Press Co., Kalamazoo, Mich.
Buffalo Forge Company, Buffalo, N. Y.
Burke Machine Tool Co., Conneaut, Oh

Drilling Machines, Vertical
Atlas Press Co., Kalamazoo, Mich.
Buffalo Forge Company, Buffalo, N. Y.

Drives, Lathe
Cullman Wheel Co., 1339 Altgeld St., Chgo.
Hardinge Brothers, Inc., Elmira, N. Y.

Electric Blowers
Breuer Elect. Co., 846 Blackhawk St., Chgo.
Clements Mfg. Co., 6650 Narragansett Chicago
Standard Electrical Tool Co., Cincinnati, O.

Electric Motors with Integral Brakes
Star Mchs. & Eng. Co., Bloomfield, N. J.

Electrical Instruments
Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago

Elevating Tables
Hamilton Tool Company, Hamilton, Ohio

Emery Wheel Dressers and Cutters
Western Tool & Mfg. Co., Springfield, O.

Emery Wheel Dressers, Diamond
Mendes Cutting Factories, Inc., 505 Fifth Ave., New York City

End Mills
Progressive Tool & Cutter Co., Ferndale, Mich.
Putnam Tool Co., Detroit, Mich.

Etching Machines, Electric
Frampton Electrical Eqpt. Co., Dayton, O.
Lama Electric Equipment Co., Toledo, Ohi.
Taylor Sales Co., Detroit, Mich.

Exhaust Blowers
Chelsea Fan & Blower Co., 270 W. 15th St., New York City
Standard Electrical Tool Co., Cincinnati, O.

Experimental Work
American Tool Works, Inc., Hartford, Conn.

Fans
Chelsea Fan & Blower Co., 270 W. 15th St., New York City

Fasteners, Belt
Flexible Steel Lacing Co., 4670 Lexington St., Chicago, Ill.

Feeder Tubes
Sutton Tool Co., Detroit, Mich.

Feed Fingers for Auto. Screw Mchs.
Modern Collet & Machine Co., Ecorse, Mich.
Sutton Tool Co., Detroit, Mich.

Files
Grobet File Co., 3 Park Place, New York City

Files, Rotary
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Filing Machines
Grob Bros., West Allis, Wis.
Oliver Instrument Co., Adrian, Mich.

Filing Room Equipment
Wardwell Manufacturing Co., Cleveland, O.

Flexible Shaft Accessories
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Flexible Shaft Machinery
Haskins Co., H. G., 4654 W. Fulton, Chgo.
Pratt & Whitney Co., Hartford, Conn.
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Floating Holders
Gairing Tool Co., Detroit, Mich.

Furniture, Machine Shop
Western Tool & Mfg. Co., Springfield, O.

Gage Blocks, Precision
Ford Motor Co., Johansson Div., Dearborn, Mich.

Gages
Micro Products Co., Detroit, Mich.
Swedish Gage Co. of Amer., Detroit, Mich.

Gages, Chrome Plated
Vinco Tool Co., Detroit, Mich.

Gages, Gears, Spur and Helical
Vinco Tool Co., Detroit, Mich.

Gages, Pin, Plug, Ring and Snap
American Tool Works, Inc., Hartford, Conn.

Gages, Taper
Hartford Special Mchy. Co., Hartford, Conn.
Vinco Tool Co., Detroit, Mich.

Gears
Abart Gear & Mchs. Co., 4832 W. 16th St., Cicero, Ill.
Massachusetts Gear & Tool Co., Woburn, Mass.
Taylor Machine Co., Cleveland, Ohio

Gears, Master
Vinco Tool Co., Detroit, Mich.

Gear Motors
Star Mchs. & Eng. Co., Bloomfield, N. J.

Generators
Chicago Electric Co., 1338 W. 22nd St., Chicago, Ill.
Star Mchs. & Eng. Co., Bloomfield, N. J.

Grinders, Air
M-B Products, Detroit, Mich.

Grinders, Bench
Baldor Electric Co., St. Louis, Mo.
Standard Electrical Tool Co., Cincinnati, O.
Vonnegut Moulder Corp., Indianapolis, Ind.

Grinders, Disc
Oliver Machinery Co., Grand Rapids, Mich.
Standard Electrical Tool Co., Cincinnati, O.
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Grinder, Electric
Chicago Wheel & Mfg. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.
Dremel Mfg. Co., Racine, Wis.
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.

Grinders, Electric Bench
Baldor Electric Co., St. Louis, Mo.
Standard Electrical Tool Co., Cincinnati, O.
Valley Electric Corp., St. Louis, Mo.

Grinder, Flexible Shaft
Haskins Co., H. G., 4654 W. Fulton, Chgo.
Mall Tool Co., 7742 S. Chicago Ave., Chicago
N. A. Strand & Co., 5001 N. Lincoln, Chgo.

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Presses, Arbor
Atlas Press Co., Kalamazoo, Mich.
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Sheldon Machine Co., 3355 Cottage Grove Ave., Chicago, Ill.
Wilson, R. K., Buffalo, N. Y.

Presses, Power
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Presses, Punch
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
Lewthwaite Mchs.Co.,T.H.,311E.47th.,N.Y.

Pullers, Gear and Wheel
Armstrong-Bray & Co., 315 N. Sheldon St., Chicago, Ill.

Pulleys, Steel and Wood
Pateman Bros., 705 W. Washington Blvd., Chicago, Ill.

Pulleys, Vacuum Cup
Vacuum Cup Metal Pulley Co., Detroit

Pumps, Coolant
Fulflo Specialties Co., Blanchester, Ohio

Pumps, Lubricant
Ruthman Machinery Co., Cincinnati, Ohio

Punch Press Feeds
Littell Machine Co., F. J., 4125 Ravenswood Ave., Chicago, Ill.
Wittek Mfg. Co., 4809 W. 24th Place, Chgo.

Punch, Shear and Bender, Hand
Armstrong-Blum Mfg. Co., 841 N. Francisco Ave., Chicago

Punches, Hand
Armstrong-Blum Mfg. Co., 841 N. Francisco Av., Chicago
Buffalo Forge Company, Buffalo, N. Y.
Lewthwaite Mchs. Co., T. H., 311 E. 47th, New York
Whitney Metal Tool Co., Rockford, Ill.

Punches and Dies
Lewthwaite Mchs.Co.,T.H.,311E.47th.,N.Y.

Pusher Tubes
Modern Collet & Machine Co., Ecorse, Mich.

Pyrometers
Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago
Pyrometer InstrumentCo., 102-105 Lafayette St., New York City

Pyrometers, Optical
Pyrometer InstrumentCo., 102-105 Lafayette St., New York City

Pyrometers, Portable & Stationary
Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago, Ill.

Pyrometers, Surface
Pyrometer InstrumentCo., 102-105 Lafayette St., New York City

Racks
Yoke Supply Co., Canton, Ohio

Racks, Cut
Massachusetts Gear & Tool Co., Woburn, Mass.

Reamer Holders
W. H. Nicholson & Co., Wilkes-Barre, Pa.

Riveters, Multiple Spindle
Grant Mfg. & Mchs. Co., Bridgeport, Conn.

Riveters, Pneumatic
Grant Mfg. & Mchs. Co., Bridgeport, Conn.

Riveting Machines
Grant Mfg. & Mchs. Co., Bridgeport, Conn.

Rod Cutters
Armstrong-Blum Mfg. Co., 841 N. Francisco Av., Chicago
Lewthwaite Mchs.Co.,T.H.,311 E.47th.,N.Y.

Router Bits
Putnam Tool Co., Detroit, Mich.

Salvage
Vinco Tool Co., Detroit, Mich.

Saw Sharpening Machines
Rogers & Co., Samuel C., Buffalo, N. Y.
Wardwell Manufacturing Co., Cleveland, O.

Screw Drivers, Electric
Haskins Co., R. G., 4654 W. Fulton, Chgo.

Screw Machine Parts
Modern Collet & Machine Co., Ecorse, Mich.

Shafts, Flexible
R. G. Haskins Co., 4654 W. Fulton, Chicago
Pratt & Whitney Co., Hartford, Conn.
Strand Co., N. A., 5001 N. Lincoln St., Chgo.
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Shapers
Western Mchs. Tool Wks., Holland, Mich.

Shaping Machines
Osborne & Sexton Machy. Co., Colum
Western Mchs. Tool Wks., Holland, Mich.

Shears, Hand
Armstrong-Blum Mfg. Co. 841 N. Francisco Av., Chicago
Beverly Throatless Shear Co., 2007 W. 110th Place, Chicago, Ill.
Lewthwaite Machine Co., T.H., 311 E. 47th St., New York
Whitney Metal Tool Co., Rockford, Ill.

Shear, Power
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Shears, Slitting
Beverly Throatless Shear Co., 2007 W. 110th Place, Chicago, Ill.
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
National Machine Tool Co., Racine, Wis.

Shears, Throatless
Beverly Throatless Shear Co., 2007 W. 110th Place, Chicago, Ill.

Speed Saws, Universal
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Classified Finding Index

Lathe Drives
Cullman Wheel Co., 1359 Altgeld St., Chgo.
Hardinge Brothers, Inc., Elmira, N. Y.

Lathes, Bench
Atlas Press Co., Kalamazoo, Mich.
Rivett Lathe & Grinder Inc., Brighton, Boston
Sheldon Machine Co., 3256 Cottage Grove Ave., Chicago, Ill.
South Bend Lathe Works, South Bend, Ind.

Lathes, Back Geared
Rivett Lathe & Grinder, Inc., Brighton, Boston
South Bend Lathe Works, South Bend, Ind.

Lathes, Brake Drum
South Bend Lathe Works, South Bend, Ind.

Lathes, Engine
South Bend Lathe Works, South Bend, Ind.

Lathes, Gap Head
South Bend Lathe Works, South Bend, Ind.

Lathes, Manufacturing
Sundstrand Machine Tool Co., Rockford, Ill.

Lathes, Precision Bench
Hardinge Brothers, Inc., Elmira, N. Y.

Lathes, Precision Bench Screw Cutting
Hardinge Brothers, Inc., Elmira, N. Y.

Lathe Service Parts
Millholland Sales Co., Indianapolis, Ind.

Lathes, Screw Cutting
South Bend Lathe Works, South Bend, Ind.

Lathes, Speed
Schauer Machine Co., Cincinnati, Ohio

Leader Pins, Steel
Acme Industrial Co., 419 N. Carpenter St., Chicago, Ill.

Leather Belting, All Types
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Leather Oil Retainers
Chicago Rawhide Mfg. Co., 1200 Elston Av. Chicago, Ill.

Leather Pkg., Hydraulic & Pneumatic
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Lubricator, Automatic
Norgren Co., C. A., Denver, Colo.

Mandrels, Expanding
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, O.

Micrometers
Micro Products Co., Detroit, Mich.
Swedish Gage of America, Detroit, Mich.

Milling Attachments
Able Products Machine & Tool Works, Inc., 20 W. 22nd St., N. Y.
Burke Machine Tool Co., Connesut, Ohio
Wm. Carroll & Son, Norwood, Cincinnati, O.

Milling Machines, Bench
Burke Machine Tool Co., Connesut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Precision Bench
Hardinge Brothers, Inc., Elmira, N. Y.

Milling Machines, Hand
Burke Machine Tool Co., Connesut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Plain
Burke Machine Tool Co., Connesut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Universal
Hack Universal Die Making Machine Co., 440 N. Oakley Blvd., Chicago, Ill.

Mills, Adjustable Hollow
Genesee Mfg. Co., Rochester, N. Y.

Molds, Hammer
J. Horst Mfg. Co., Lafayette, Ind.

Motors
Chicago Electric Co., 1338 W. 22nd St., Chicago, Ill.

Motors, Small Universal
Dremel Mfg. Co., Racine, Wis.
Speedway Mfg. Co., Cicero, Ill.

Motor-Generator Sets
Chicago Electric Co., 1338 W. 22nd St., Chicago, Ill.

Motor Drives, Universal
Cullman Wheel Co., 1359 Altgeld St., Chgo.

Motors, Electric Ball Bearing
Valley Electric Corp., St. Louis, Mo.

Moulds & Ladles, Hammer and Vise.
Johnston Tool Co., East Providence, R. I.

Nibbling Machines
National Machine Tool Co., Racine, Wis.

Packing, Hydraulic
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Pins and Lacing for Belting
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Pins, Leader And Dowel
Acme Industrial Co., 419 N. Carpenter St., Chicago, Ill.
Baumbach Mfg. Co., E. A., 1812 So. Kilbourne Ave., Chicago

Pipe Cutters
Ridge Tool Co., Elyria, Ohio

Pipe Vises
Ridge Tool Co., Elyria, Ohio

Pipe Wrenches
Ridge Tool Co., Elyria, Ohio

Point Thinning Machines
Oliver Instrument Co., Adrian, Mich.

Press Brakes
Dreis & Krump Mfg. Co., 7440 Lonsdale Blvd., Chicago, Ill.

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Special Tools and Machinery
American Tool Works, Inc., Hartford, Conn.

Speed Reducers
Abart Gear & Mchc. Co., 4632 W. 16th St., Cicero, Ill.
Cullman Wheel Co., 1359 Altgeld St., Chgo.

Spinning Lathes, Metal
Oliver Machinery Co., Grand Rapids, Mich.

Spools & Nuts for Auto. Screw Mchs.
Sutton Tool Co., Detroit, Mich.

Spot Welding Machines, Speed.
Elster Engineering Co., Inc., Newark, N. J.
Pier Equipt. Mfg. Co., Benton Harbor, Mich.

Sprockets
Cullman Wheel Co., 1359 Altgeld St., Chgo.
Massachusetts Gear & Tool Co., Woburn, Mass.

Stampings
Gerding Brothers, Cincinnati, Ohio

Steel Lockers and Shelving
Pasman Bros., 705 W. Washington Blvd., Chicago, Ill.

Straightening Machines
Whitney Metal Tool Co., Rockford, Ill.

Tap Extractors
Walton Co., Hartford, Conn.

Tap Holders
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago
Scully-Jones & Co., 1909 S. Rockwell St., Chicago, Ill.

Tapping Machines
Western Mchs. Tool Wks., Holland, Mich.

Tapping Attachments
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago, Ill.
Western Mchc. Tool Wks., Holland, Mich.

Tapping Jigs, Universal
Heuser Mfg. Co., 1638 No. Paulina St., Chicago, Ill.

Tapping Machines and Attachments
Burke Machine Tool Co., Conneaut, Ohio
Cleereman Mchc. Tool Co., Green Bay, Wis.
Etco Tool Co., 594 Jennson Av., Brooklyn, N. Y.
Haskins Mchy. Co., R. G., 4654 W. Fulton St., Chicago, Ill.
Procunier Safety Chuck Co., 14 So. Clinton St., Chicago, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Thermometers, Resistance Type
Illinois Testing Laboratories, Inc., 150 West Austin Ave., Chicago, Ill.

Thread Dials
J. M. Colvin, Yonkers, N. Y.

Threading Machines, Automatic, Stnd
Grant Mfg. & Mchc. Co. Bridgeport, Conn.

Threading Tools
Armstrong Bros. Tool Co., 908 N. Francisco Av., Chicago
Ridge Tool Co., Elyria, Ohio.
Rivett Lathe & Grinder Inc., Brighton, Boston

Tool Holders
Armstrong Bros. Tool Co., 908 N. Francisco Av., Chicago
Rigid Toolholder Co., Detroit, Mich.
Western Tool & Mfg. Co., Springfield, O.

Tools
Vinco Tool Co., Detroit, Mich.

Tools, Abrasive
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Tools, Boring
Armstrong Bros. Tool Co., 908 N. Francisco Av., Chicago
Gairing Tool Co., Detroit, Mich.

Tool Grinding
Machinist's Tool Grinding Co., 3038 W. Van Buren St., Chicago

Tools, Lathe and Planer
Armstrong Bros. Tool Co., 908 N. Francisco Av., Chicago

Tools, Machinists'
Armstrong Bros. Tool Co., 908 N. Francisco Av., Chicago

Tools, Multi-Diameter
Gairing Tool Co., Detroit, Mich.

Tube Flanging Machines
Grant Mfg. & Mchc. Co., Bridgeport, Conn.

Turret Lathes
Millholland Sales Co., Indianapolis, Ind.

Turret Lathes Tools
Millholland Sales Co., Indianapolis, Ind.

Universal Drill Jigs
Heuser Mfg. Co., 1638 No. Paulina St., Chicago, Ill.

Universal Joints
American Tool Works, Inc., Hartford, Conn.
Chicago Gear Works, 769 W. Jackson Blvd., Chicago

Used and Rebuilt Machinery
Alamo Engine Co., Hillsdale, Mich.
American Machinery Co., Cleveland, Ohio
Barad Tool & Sup. Co., 1741 Lafayette, N. Y. C.
Beal & Co., Jos., Boston, Mass.
Beatty Machine Mfg. Co., Hammond, Ind.
Belyea Co., Inc., 150 W. 18th St., New York, N. Y.
Bernstein & Co., Geo. M., 128 Clinton, Chgo.
Bicoar Mfg. & Mchy. Co., Springfield Ill.
Bradley Machinery Co., Detroit, Mich.
Brown Machinery Co., St. Louis, Mo.
Brownell Machinery Co., Providence, R. I.
Clinton Mchy. Co., 33 S. Clinton St., Chgo.
Columbia Machinery Co., Fort Wayne, Ind.
Craig, Thos. H., Bridgeport, Conn.
Davis Machinary Co., Toledo, Ohio.
Eastern Machinery Co., Cincinnati, O.
Emerman, Louis E. & Co., 1761 Elston Ave., Chicago, Ill.
Easley Machinery Co., E. I., 325 Reed St., Chicago, Ill.
Farles Manufacturing Co., Decatur, Ill.
Ford Machinery Sales Co., Ford City, Pa.

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Used and Rebuilt Machinery—Cont.

George, James W., Detroit, Mich.
Goldman, Harvey H., Detroit, Mich.
Hill, Clarke & Co., 645 W. Washington Blvd., Chicago, Ill.
Howarth Mchy. Co., Inc., C. C., Detroit, Mich.
Hyman & Sons, Joseph, Philadelphia, Pa.
Indianapolis Machinery & Supply Company, Indianapolis, Ind.
Interstate Mchy. Co., 130 S. Clinton, Chgo.
Iroquois Machinery Co., Buffalo, N. Y.
Johnson & Sons Machinery Co., Wm. C., St. Louis, Mo.
Johnstone Mchy. Ex., Toledo, Ohio
Jones Machine Tool Co., Cincinnati, Ohio
Kennard-Rafkin Mchry. Corp., 160 Liberty St., New York, N. Y.
Kennard-Williams, 114 Liberty St., New York, N. Y.
Lucas, J. L., Bridgeport, Conn.
McDonald Machinery Co., St. Louis
Marr-Galbreath Mchy. Co., Pittsburgh, Pa.
Midwest Equipment Co., 628 W. Lake St., Chicago, Ill.
Miles Machinery Co., Saginaw, W. S., Mich.
Molitor Machinery Co., Charles L., 120 S. Clinton St., Chicago, Ill.
Morey & Co., 45 Mill St., Astoria, Long Island, N. Y.
Morris Machinery Co., Newark, N. J.
Noble Mchs. Co., Fort Wayne, Ind.
Norton-Broadway Machinery Co., Cincinnati, Ohio
O'Brien Machinery Co., Philadelphia
Ohio Mchy. & Supply Co., Cincinnati, Ohio
Ott Machinery Sales Co., Detroit, Mich.
Osborne & Sexton Machy. Co., Columbus, O.
Reliance Machinery Sales Co., Pittsburgh, Pa.
Riverside Machinery Depot, Detroit, Mich.
Rosenkranz & Weisbecker, 2309 A. Singer Bldg., New York City
Russell Machine Co., Pittsburgh, Pa.
Scott-Hanzbach Mchy. Co., 4607 W. 20th St., Chicago
Scully Jones & Co., 1901 S. Rockwell St., Chicago, Ill.
Segal Machinery Co., 117 S. Clinton St., Chicago, Ill.
Simmons Machine Tool Corp., Albany, N. Y.
Standard Mchy. Co., Grand Rapids, Mich.
Strong, Carlisle & Hammond Co., Cleveland.
Sun Machinery Co., 28 Van Buren Street, Newark, N. J.
United Mchy. & Supply Co., St. Louis, Mo.
Victor Machinery Co., 128 S. Clinton Street, Chicago, Ill.
Victor Machinery Exchange 251 Centre St., New York, N. Y.
Vine, R. A., Detroit, Mich.
Wain Mchy. Sales, Chas. E., Detroit, Mich.
Weber, H. J., Riverside, Ill.
Wertman Machinery Co., Cleveland, Ohio
Wessendorf, Nelms & Co., Houston, Texas
West Penn Machinery Co., Pittsburgh, Pa.
White Machy. Co., A. D., 108 N. Jefferson St., Chicago
Wiener Mchy. Co., Inc., 237 Centre St., New York City
Wigglesworth Mchy. Co., Cambridge, Mass.
Wolnick Machinery Sales, 9 S. Clinton St., Chicago, Ill.

Vacuum Cleaners, Portable

Breuer Elec. Co., 846 Blackhawk St., Chgo.

Vacuum Cleaners, Industrial

Breuer Elect. Co., 846 Blackhawk St., Chgo.

Valves, Foot, Lever & Solenoid

Nicholson & Co., W. H., Wilkes-Barre, Pa.

Vises, Drilling Machine

Armstrong-Blum Mfg. Co., 841 N. Francisco Av., Chicago
Armstrong Bros. Tool Co., 806 N. Francisco Av., Chicago
Graham Manufacturing Co., Providence, R. I.
Hauser Mfg. Co., 1638 No. Paulina St., Chicago, Ill.
L. W Chuck Co., Toledo, Ohio
Martin Tool & Die Works, J. E., Springfield, O.
National Machine Tool Co., Racine, Wis.
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.

Vises, Drill

Johnson Tool Co., East Providence, R. I.

Vises, Machinists'

Chicago Tool & Engr. Co., 8360 So. Chicago Ave., Chicago, Ill.
L. W Chuck Co., Toledo, Ohio
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
Western Tool & Mfg. Co., Springfield, O.

Vises, Milling Machine

Graham Manufacturing Co., Providence, R. I.
Hartford Special Mchy. Co. Hartford, Conn.
L. W Chuck Co., Toledo, Ohio
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.

Vises, Shaper

Graham Manufacturing Co., Providence, R. I.
L. W Chuck Co., Toledo, Ohio

Vises, Universal Swivel

Able Products Machine & Tool Works, Inc., 20 W. 22nd St., N. Y.

Welding Machines, Electric Spot

Eisler Engineering Co., Inc., Newark, N. J.
Pier Equipment Co., Benton Harbor, Mich.

Welding Machines, Resistance

Eisler Engineering Co., Inc., Newark, N. J.
Pier Equipt. Mfg. Co., Benton Harbor, Mich.

Wheel Pullers

Armstrong-Bray & Co., 315 N. Sheldon St., Chicago, Ill.

Wheels, Grinding

Chicago Wheel & Mfg. Co., M.C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Woodworking Machinery

Tannewitz Works, Grand Rapids, Mich.

Worm Gear Motor Units

Star Mchs. & Eng. Co., Bloomfield, N. J.

Wrenches, Ratchet

Lowell Wrench Co., Worcester, Mass.

Wrenches, Socket

Lowell Wrench Co., Worcester, Mass.

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Automatic, ⅜" Gridley Model G.
Autocall system No. 2510.
Drill, Allen 2 spindle b. b.
Drill, Baker 3" heavy duty.
Drill, Natco Model 5D multiple.
Lathe, 18x8 Monarch with turrets.
Lathe, No. 2 B. & O. turret (1").
Planer, 36x36x8' Gray.
Shaper, 20" Ohio, c. d.
Welder, No. 259A12 T. Gibb. 60-440 v.

FOR SALE BY

Brownell Machinery Co., - 150 Pine St., Providence, R. I.

Drill, 3-spindle Avey, b. b.
Hammer, 125 lbs. Beaudry pwr. forg.
Lathe, 60"x30' Pond.
Lathe, 32"x28' New Haven.
Lathe, 32"x17' Reed.
Lathe, 20"x10' Whitcomb-B., q.c.g.
Miller, No. 3 Hendey universal.
Miller, No. 2-M P. & J. automatic.
Miller, No. 13-B B. & S. manufact.
Planer, 24"x24"x6' Whitcomb.

FOR SALE BY

Thomas H. Craig, Jr., - 41 Mountfort St., Bridgeport, Conn

Flywheel press, Waterbury-Farrel No. 50, like new	$ 375.
Header, o. d., s. s., Waterbury-Farrel No. 4	1000.
Lathe, 16"x10' Hendey, yoke head	650.
Lathe, 16"x6' Cisco, quick change gear	250.
Miller, hand, Whitney No. 6	100.
Production polishing and finishing machine, type A	475.

FOR SALE BY

Ott Machinery Sales, Inc., • 548 Second Ave., Detroit, Mich.

Automatics, B. & S. Nos. 00, 0, 2; Cleveland Model A 1½, 2½ & 2¾"; Fay 14"x19"; Acme Nos. 52 & 54; Gridley, 4 spdl. ¾", 1¼", 1¼" & 2¼".
Drills, h.s., b.b. Allen, Avey, Leland & Gifford 4-spindle No. 2; also power feed.
Drill, rad. Prentice 4'; American 5'.
Elec. h. s. furnace, Hoskins 12x8x16".
Gear shapers. Fellows Nos. 6, 61, 7, 712 and 75 high speed.
Gear generators, Gleason 8" mfg. st. bevel; Gleason 15" spiral bevel, roughers and finishers; No. 5A Lees-Bradner.
Grinders. Brown & S No. 13, tool No. 2 B. & S., univ. & surface; Cincinnati No. 3 Univ. 12x48".
Heald No. 65 & 75 Capital internal.

Lathes, Monarch 14"x6' q.c.; Springfield 16"x6' relieving and taper attach.; Hendey, 16"x8'; Flather 16"x6; Hamilton g.b 16"x9'
Lathes, turret, Acme 2¾"x36" g. h.; J. & L. 2"x24" & 3"x36"; Warner & Swasey Nos. 2, 4 & 6.
Milling machines, Cleveland No. 2 universal; Cin'ti plain Nos. 2 & 4 high power; LeBlond No. 4 plain cone; Kempsmith Nos. 12 and 33 Mfg.; Model B Becker vertical.
Planers, Cincinnati 26x26x8' 1-head; Cin'ti 60"x60"x20' 3-heads, m. d.;
Presses, Ferracute P2, 3 and 4, and D G 53; Stoll DCSS 54" bu. 5¾" shaft; Lucas 50 ton horizontal; Metalwood 30 ton hydraulic.

FOR SALE BY

Belyea Company, Inc., • 150 W. 18th St., New York, N. Y.

D. C. MOTORS
Adj. Speed—230 Volt

H. P.	TYPE	SPEED
1—1500	West.	470/ 690
1— 250/410	Cr. Wh.	1000/1200
2— 150	G. E.	1000/1200
2— 125	West.	240/ 600
2— 120	G. E.	300/ 750
3— 80	Diehl	500/1100
1— 75	G. E.	300/ 900
2— 60	El. Dy.	450/1200
5— 60	El. Dy.	525/1050
2— 50	West.	225/ 600
1— 40/50	Cr. Wh.	175/ 700
1— 40	West.	300/ 900
1— 40	West.	600/1200
1— 35	Cr. Wh.	800/1600
12— 25	West.	650/2200
2— 20	West.	375/1500
1— 20	West.	550/1100
2— 20	G. E.	500/1500
20— 10	West.	500/1500
25— 7½	West.	400/1600
26— 5	West.	400/1600
1— 5½	West.	600/1800
10— 3½	West.	450/1800
15— 2½	West.	450/1800

MOTOR GEN. SETS.

1—1500 k. w., G. E., type-M. P. C., D. C. Gen. 250 v., com'd. inter pole, conn. to 2150 h. p., 8 P. F., type ATI. synch. motor, 11,431/6600 v., 360 r. p. m., 3 ph. 60 cy.
1—1000 k. w., G. E. type-M. P. C., D. C. Gen. 250 v., conn. to 1400 h. p. type ATI, synch. motor, 6600/2300 v., 514 r. p. m., 3 ph. 60 cycle.

1—500 k. w. West. D. C. Gen. 250 v., conn. to 710 h. p., 8 P. F. synch. motor 4600/2300 v., 1200 r. p. m., 3 phase, 60 cycle.
1—200 k. w., Crocker Wheeler type 149DA comp'd. inter pole, 250 v., D. C., conn. to 30 h.p., Sq. Cage, A. C. motor, 2300/440 v., 720 r. p. m., 3 ph., 60 cy.

A. C. MOTORS
Synch. Type

H. P.	TYPE	VOLTS	SPEED
1—2850	G. E.	2300/4150	450
1— 675	Al. Ch.	2200/ 550	900
1— 600	G. E.	2200/ 550	257
1— 260	Al. Ch.	2200/ 440	720
1— 125	West.	2300	900
1— 50	G. E.	440/220	1200
1— 35	G. E.	440/220	1200

SLIP RING

1—1200	West.	2200	360
1— 600	G. E.	2300/550	257
1— 600	G. E.	2300/440	705
1—450/360	West.	2200	875/700
1— 400	West.	2300	514
1— 400	West.	550	505
1— 300	G. E.	550	575
1— 250	F. Morse	2200	1200
1— 250	West.	2300/440	700
2— 200	West.	220/440	900
1— 200	G. E.	220/440	900
1— 150	G. E.	440	1750

SQUIRREL CAGE TYPE

1— 300	Cr. Wh.	2300/220	580
1— 250	West.	2300/440	580
1— 150	G. E.	220/440	900
1— 150	West.	220/440	720
1— 150	West.	220/440	580

Above is Only Partial Listing. We Specialize in All Electrical Equipment, Motors, Pumps, Generators.

FOR SALE BY

Marr-Galbreath Machinery Co., 55 Water St., Pittsburgh, Pa.

Quality Not Reflected in These Low Prices.

Air comp., 17"x10" Ing.-R., 45 lbs.
Air comp., 12"x10" Bury, belted.
Air compressor, 5"x5" Ing.-R., m.d.
Air compressor, portable ½, 3 and 5 h. p.
Bender & straightener, No. 4 H. & J.
Blower, 4 E. Buffalo 1/60/220.
Blower, No. 3 Root, 2500 c. f. m., 12" outlet, 16 oz. pressure.
Bolt cutter, 3" Acme dies, b. b.
Bolt threader, 2½" Landis dbl., m. d.
Boring mill, 30" Colburn, turret hd.
Boring mill, 30" Bullard VTL, threading attachment.
Boring mill, floor, 6" bar N. B. P., 230 v. d. c., 2 column.
Brakes, hand, 4'x14 ga. Robinson
Brakes, hand, 6'x16 ga. Keene.
Brake lining, punch and riveting machine, m. d.
Bulldozer, No. 6 W-W., clutch, b.d.
Bulldozer, No. 22, W.-W., m. d.
Chain hoists, 1½, 2, 3 and 4-ton.
Crusher, Allis-Chalmers, 9x8", 2-roll, belt drive.
Die sinker, No. 3 P. & W., r. t.
Driller, 5, 6-sp. Detroit, chucks.
Drill, 28" Superior, b. g., power fd.
Drill, 5, 6 spdl. L.-G., b. b., m. d.
Drill, radial, 3½' Cin-Bick. t. a., m. d.
Electric drills, portable, ½" with chucks.
Generator, 125 k. v. a. 3/60/220/900.
Grinder, Nos. 1, 1½ & 2, tool & cut.
Grinder, 7½h.p., U.S. dbl. end, 3/60/440
Grinder, surf., No. 2 B. & S., m. d., magnetic chuck.
Grinder, pl. 11 B. & S. 4x30" (cheap).
Hammer, power, 50 lb. Boss, b. d.
Hammer, power, 50 lb. Little Giant, belt drive.
Hammer, 200 lb. Beaudry, power.
Hammer, 800 lb. Erie SF steam or air.
Hammer, Syntron Elec., 1/60/110/.
Hammer, No. 2B Nazel, motor dr.
Hammer, 400 lb. Bliss board drop. b. d.
Header, cold, ⅜" W.-F. D. S.-OD.
Hoist, chain, 4-ton triplex, Y. & T.
Jointer, bench, 4" Wallace ½ h.p. mtr.
Keyseater, No. 2 Catlin, cap. 2"x15".
Lathe, 32"x16' Bridgeford g. h., m. d.
Lathe, 36"x16' L. & S. g. h., m. d.
Lathe, 27"x12' New Haven, $150.
Lathe, Fox Monitor, 18"x6' Springfi.
Lathe, 11" Sundstrand, g. h., s. p. d.
Lathe, turret, No. 4 W. & S., bar feed, m. d. (2).
Lathe, 12"x8' R. P., g. h., s. p. d.
Lathe, 18"x8' L. & S., q. c. g., t. a.
Lathe, 20"x8' Hendey, tie bar.
Lathe, 14"x19" Fay automatic.
Miller, hand, No. 1 U. S. (2).
Miller, plain 1-y B. & S., rack feed.
Miller, No. 4 Hendey, Lincoln type.
Miller, No. 4 Ohio table 101".
Pipe machine, 12" Cox., b. d.
Planer, Gray, 56x48x10', 4 heads.
Planer, 30"x30"x8' Liberty, 2-h. m. d.
Planer, 48"x48"x10' Gray, 3-hds., b. d.
Press, punch, No. 35 Niagara, plain, belt drive.
Press, No. 2 Con., o. b. i., 2" str., m. d.
Press, D. C. 138-C Stoll, t. r., b. g.
Press, S.C. 57, 57½ & 58 Toledo, b. g.
Press, S. C. 79½ Bliss, t. r., d. b. g., 16" stroke.
Press, No. 61, Bliss, reducing 5" stroke.
Press, Arbor, No. 8 Greenerd, hand
Press, 30-ton Lourie hydraulic.
Press, Arch, No. 3A Mossberg dial feed, 12 positions.
Press, trimming 58½ Toledo d. b. g., 10" stroke, friction clutch, m. d.
Presses, o. b. i., 19 Bliss, 4" str.
Press, No. 83 Bliss redu., bg., 10" str
Press, hydraulic 200 ton oil gear pump m. d., rapid ac., 10" st, bed 24x16".
Punch & s., s. e., 24" tht. Cleve. "C".
Punch & s., 25x24 U. Buf. univ., m. d.
Rolls, 42"x3" Pexto, latch hsgs., hand.
Rolls, bend., 10'x½" H. & J., d. e, m d
Sandblasts, Pangborn AU-3 & AA-1.
Sandblast, Leiman, size A-1.
Screw machine, No. 2 P. & S. plain.
Shaper, 20" G. & E. b. g., hi. duty, belt drive.
Shaper, 21" Smith & Mills.
Shaper, 24" Barker b. g. V-ram, b. d.
Shaper, 24" Gould & Eberhardt, b. g., high duty, b. d.
Shear, bar 3" United, 24" blade, m. d.
Shear, squar. 52"x16 ga. ma., m. d.
Shear, plate 154"x¼" United, m. d.
Shear, plate, 126"x¼" United, m. d.
Shear, plate, 84"x1" L. & A., m. d.
Shear, slit'g, Buffalo 24-S (Armor pl.)
Shear, plate, 16'x½" L. & A. 20" gap.
Steam turbines, 100 h. p. 900 rev (2).
Valve refacer, Kwik-Way, cabinet base, m. d.
Welder, Arc 150 amp. belted,
Welder, Arc 300 amp. 3/60/220.
Welders, arc, 35 amp., transformer,
Welding & cutting generator, Carbic
Wire str. & C-O—¼"x4' Shuster.
Wheel press, 60 ton 34"x8½', b. d.

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Wessendorff, Nelms & Co., - - - - Houston, Texas

Brake, Chicago No. 204, 10′, 10 ga.
Drill, No. 310 Baker.
Drill, radial American 4′ tr. pur., m. d.
Drill, radial American 5′ triple purpose, m. d.
Iron worker, Buffalo No. 4 m. d.
Iron worker, Buffalo No. 1 m. d.
Lathe, American 24″x24′ g. h.
Lathe, Pond 38″x17′ triple geared.
Saw, Ryerson friction, m. d.

FOR SALE BY

McDonald Machinery Co., 1535 N. Broadway, St. Louis, Mo.

Air comp., Chicago Pneumatic, 12x10
Bolt mchs., Landis & Acme 1½″.
Boring mill, Lucas No. 21 horizontal.
Boring mills, Barrett 5″ bar horiz.
Boring mill, Niles 36″ vert., 2 hds.
Boring mill, Gisholt 42″ vert. m. d.
Boring mills, Baush 44″ vert., m. d.
Brake, Ohl 10′ No. 10 ga. m. d. press.
Drills, American 5′; Mueller 2½′.
Gear cutter, G. & E. 36″ s. p. d.
Gear cutter, G. & E. 60″ m. d.
Gear hobber, G. & E. 24″.
Grinder, surface B & S. No. 2.
Grinder, B. & S. Nos. 10 & 16 plain.
Grinder, B. & S. No. 13 univ. tool.
Grinder, Gardner 52″ m. d., horiz. disc.
Lathes, Reed-Prentice 16″x8′, q. c. g., grd. hd.; Hendey 14″x6′, q. c. g.; 50 others in stock.
Milling machines, B. & S. No. 5, vert.
Milling mches., B. & S. No. 1½ Cinc. No. 2, Hendey No. 1-B, Kemp. No. 3; Ohio No. 29; vertical slott. attch., all universal; Kemp. No. 1. LeBlond No. 3-H; Brown & S. No. 3-B, s. p. d., Brown & Sharpe No. 3, all plain, Cincinnati 12″ Mfg.; Milw. No. 3-B s. p. d., d. o. Cincinnati No 3-S pl., s. p. d.
Punch press, Toledo No. 204 d. c. Cons. Nos. 1 & 2 o. b. i. Niagara No. 66 D d. c. Ohl d. c. grd.
Shapers, G. & E., S. & M., Cin., Ohio, American, Steptoe, Queen City, 12″, 16″, 18″, 20″, 24″ and 26″; S & M. 28″, s. p. d.; Cin. 24″ m d. g. b.; American 24″ m. d., gear box.
Screw machine, Brown & Sharpe. No. 2 auto.; B. & S. No. 00 Auto.
Turret lathes, W. & S. No. 2 Auniv.

FOR SALE BY

Brown Machinery Co., - - 2333 N. 9th St., St. Louis, Mo

Brake, Chicago Steel, 8′ 14 gauge.
Drills, 14, 16, 20, 22, 24 & 42″
Drills, radial, 3′ Fosdick.
Gear hobbers, G. & E. 12″ & 24″.
Grinders, cylindrical, 10x30″ Norton, 12x36″ Modern, self-contained.
Grinders, disc, No. 41-20 Besly, m. d.; No. 6-20 Besly; No. 220 Badger automatic.
Groover, power, 6′ horn.
Hammers vert. 40 & 80-lb. Perfect.
Lathes, 16″x6′ & 8′ Monarch q. c. g.; 16″x6′ & 18″x8′ Bradford; 18″x8′ American and LeBlond; 16″x8′ Monarch grd. hd. m. d.; 18″x12′ American grd. hd., taper & turret attach.; 20″x8′ LeBlond, heavy, q. c. g.; 26″ x 12′ Putnam, taper attach., 36″x18′ Niles q. c g.
Millers, plain, No. 1½ American; No. 3 B Owen vert. attach.; No. 3½ Fox; No. 2 Kempsmith.
Millers, universal, No. 2 Hendey-Norton; Lincoln type, No. 4 Hendey; slab, Briggs type No. 11.
Planer, 42″x42″x10′ Pond; 26″x26″x6′ Whitcomb.
Presses, straight side, No. 73 Swaine; No. 7 Zeh & Hahnemann.
Presses, o. b. i. Nos. 1, 2, 3, 4 Loshbough-Jordan; 5-A Willard.
Punches, sgl. end, Cleveland "C" 26″ thr. ⅝ in ⅞″; Rock River Style L rapid action, 24″ thr. ½″ in ¾″; No. 6 L. & A 24″ thr. ½″ in ¾″; No. 7 L. & A. 10″ thr. ⅝″ in ⅞″.
Punch & shear, single end, Beloit No. 53; cap. ⅝″ in ⅞″.
Punch & shears, dble. end, No. L-10 Badger 10″ thr. ½ in ¾″.
Riveters, No. 5A High Speed ½″ cap.; Grant ⅝″.
Saw, cold, Higley No. 14.
Screw machines., No. 2½ P. & W.; 1x15″ P. & W.
Seamer, double, Swaine hand. 24 ga.
Shapers, 20″ Columbia & Queen City.
Shear, rotary bevel, ⅝″ Lennox.
Welders, spot, 25 k.w. Agnew; 5 k. w. Dyer.
Welder, butt, Federal, 25 cy., 440 v.

FOR SALE BY

West Penn Machinery Company

1210 House Building, Pittsburgh, Pa.

Air compressors, 30 to 2500 cu. ft.
Automatic, New Britain 6 spdl. 1x5".
Bor.mills,24" & 42" Bullard New Era
Bor. mill, 36" Bullard, side hd.,s.p.d.
Boring mill, 42", 2 heads, Bullard.
Boring mill, 48" Gisholt r.p.t., 2 hds.
Boring mill, 62" Betts, 2 heads, b. d.
Boring mill, 72" Niles, 2 heads, m.d.
Boring mill, 76" Bullard, 2 hds., b. d.
Bor. mill, hor. No. 3 Rochester, 3½" bar, m. d.
Brake, 7'x10 ga. Chicago, m. d.
Brakes, 3'x3/16" Chicago, m. d.
Bulldozers, Nos. 2, 4, 6, 9, 28, & 30.
Cranes, Electric Traveling.
Crane, crawler, gas., No. 2 Nor'wes.
Drill, radial, 4' Prentice, t. a., b. d.
Drill, radial, 6' Dresser, s. p. d.
Drills, rad.,3, 4, 5 & 6' Cin.-Bick.m.d.
Drills, rad., 2½' & 6' Foodick, s.p.d.
Drill, Baker, table 23½x17", s. p. d.
Drill, upr., No.153 Baker, No.6 m.t.
Drills, upright 10" to 36".
Drill, upright, 26" Superior, b. d.
Flanger, McCabe, ½" capacity, dies.
Gear cutters, 11", 18" & 24" Gleason.
Gear cutter, spur, D.-S. cap.2½"x3½".
Gear cutter, spur, 36"x16" Newark.
Grinder, crank, No.4A Landis spec.
Grinder,nail die,No. 1el Bridg.,md.
Grinder, disc, No. 8—20" Besly, b. d.
Grinder,pl.28"x120" Landis hyd.gap.
Grinder, surf. No. 2 B. & S., b. d.
Grinder,surf.42" Spring.,tbl. 18x84".
Grinder, sur. 14" Pratt & W., m. d.
Grinder,surf., Diamond; table 48x16"
Hammer, Blacker, power, 35-lbs.
Hammer, power,90-lb. Justice, b. d.
Hammer, pwr., 100 lb. Brad. cush.
Hammers, Nos. 2-B, 3-B, 4B, Nazel.
Hammers,steam, 600 lb. to 6000 lbs.
Hammers, stm. dr. 1500 to 10000 lb.
Lathe, 18"x8' American grd. head.
Lathe, 18"x10" Hamilton,q.c.g.b.d.
Lathe, 20"x10' L. & S. q. c. g., b. d.
Lathe, 20"x10' LeBlond, grd. hd.
Lathe,24"x16' Bridgeford,g.hd.m.d.
Lathe,30"x18' LeBl.,g.h.,q.c.g.,m.d.
Lathe, 48"x20' Pits'h.,p. c. g., b. d.
Lathe. turret, No. 6 Warner & S.
Lathe, turret, 18" Libby, m. d.
Lathe, turret, 24" Steinle, 6¾" hole.
Lathe, turret, 34" Gisholt, b. d.
Lysholm tables, 72"x30'.
Milling & drill, mche. No. 2 Knight
Miller, hand, No. 2 Pratt & W.
Miller, pl. No. 2 Kempsmith, b. d.
Miller, pl., No. 34 heavy Ohio b. d.
Miller, univ. No. 3 Kempsmith, b.d.
Miller, rotary 40" Ohio, tilted, m. d.
Miller, slab, 36"x36"x10' Ing. adj. r.
Motors, a. c. & d. c.
Nibblers, Nos. 1 and 1-A Gray.
Pickler, 4 arm Mesta, 10' radius.
Pipe mchs., 2" & 6" Landis, b. d.
Pipe machines, 8" Oster.
Pipe mches., 6" & 12" Williams.
Planer, 36"x36"x8' Gray, 3 hds., m. d.
Planer, 56"x48"x12' Detrick & H., reversing motor drive.
Press, No. 3 Bliss, Stiles type.
Press,cam,No.69N Bliss,dbl act.inc.
Press, o. b. i. Bliss, Nos. 18, 19, 20.
Presses, o. b. i., Nos. 4 & 5 Niagara.
Press, embossing, Toledo, 400-ton.
Press, embossing, Toledo, 600-ton.
Press, No. 55 Tol. s s. st. bed 2x20x19
Presses, Nos. 57, 57½ 58½ Toledo grd.
Press, reducing Ns. 83 Bliss grd. 8".
Presses, trimming, United, m. d.
Press, No. 64 Cons., 17"x17", str. 4½".
Press, No. 57 Toledo, 32"x32", str.6".
Presses, hyd. 200-ton Oilgear.
Press, No. 96-A Toledo, d. c. 5" str.
Press, dbl. crank No. 5 Bliss, 2" str.
Press, No. 6 Bliss dbl. crank, 6" str.
Press, screw, No. 87 Niagara.
Press, cam, No. 3½ Bliss, b. d.
Press, wheel, 300 ton, motor drive.
Profiler, 2-spdl., No. 14 Pratt & W.
Punch & s., No. 6 L. & A. ½" thru ½".
Riveters, air, hammer, spinning.
Roller, thread, Nos. 10, 30, 40 W.-F.
Saw, 13"x13" Peerless univ., m. d.
Saw, No. 21 Higley, cold, 10" rd. m.d.
Saw, cold, No. 6 Coch.-Bly, s. p. d.
Saws, friction, Nos. 2, 3 & 4 Ryerson.
Scale, sheet bundling, 2500 lbs.
Screw mchs. Nos. 52, 53, 55 Nat. A.
Shaper, vert., Jones 10" stroke, m.d.
Shapers, 16", 20", 24" & 36" G. & E.
Shear, circle No. 3 Bliss, 40"x20 ga.
Shear, circle No. 15A Nia., 48"x16 ga.
Shear, cir., 1" Newbold, die 14', m. d.
Shear, o. e. 27" United, 8"x2½" m. d.
Shears, alligator, 1½", 2", 3" & 4".
Shear, allig. No. 6 Mesta. 6" sq. m.d.
Shear, angle, 6"x6"x1" H. & J.
Shear, bevel, Lennox ¾", b. d.
Shear, Pels, B1,U EFG-20,13/16"-¾".
Shear, foot, 42"x16 ga. Niagara.
Shear, sq. 42"x16' Niagara, b. d.
Shear, sq. No. 196-F Nia. 8'x18 ga.
Shear, guil. No.5 H.& J. 4" sq., m.d.
Shear, sq., 12'x14 ga, Peerless, b. d.
Shear, sq. 16'x¼" Niagara, m. d.
Slotters, 6" Newton, 8" & 21" Betts.
Slotter, 72" Morton, m. d.
Straitener,angle,Newbold,4"x4"x¾".
Straightener, 1½", 4" rd. Abramson.
Straightener, No. 2 K. & R., 7-r., rap. 1½".
Table, rotary, 24"; graduated 360 deg.
Tapping machine, vertical 1" Baker.
Upsetters, 7" to 8".
Welder, spot, 100 k. w. Federal.

FOR SALE BY

Wm. M. Meyer Blower Co.

1045 W. Washington Blvd., - - - Chicago, Ill.

BLOWERS—FANS—EXHAUSTERS.

Dust Collecting—Ventilating.
Oil and gas burners, cupolas, furnaces, etc.
Roots—Connersville and centrifugal blowers.
What are your blower requirements?

FOR SALE BY

Davis Machinery Co., St. Clair & Washington Sts., Toledo, Ohio

Drill, Allen hi speed, ball bearing.
Drill, W. F. & J. Barnes 20" 4 spdl.
Drill, No. 2 Avey 2-spdl. h. s., b. b.
Grinder, No. 2 Brown & S. surface.
Grinder, No. 3 Wilmarth & M., surf.
Grinder, No. 7½ Gardner, b. b. disc.
Grinder, No 1 W. & M., tool & cut.
Grinder, No. 6 Gardner, b. b. disc.
Lathe, 15"x8' Sidney, q. c. g.
Lathe, 16"x6' Flathers, q. c. g.
Lathe, 18"x8' LeBlond, h.d., q. c. g.
Lathe, 28"x18' Pittsburgh, q. c. g.
Lathe, 16"x8' Hendey, q. c. g.
Lathe, 12"x6' Seneca Falls, q. c. g., taper and collets.
Mill, No 2 VanNorman duplex, com.
Mill, 24" Bullard vert. boring.
Mill, A B Becker vertical, s. p. d.
Mill, No. 2 Cin. hi. power pl., s. p.d.
Press, No. 53 Toledo, SS.
Shaper, 24" Potter & Johnston, crk.
Shaper, 15" Potter & J., crank.
Saw, 6x6 Peerless Hi-Sp. pwr. hack.
Sander, 15" Peerless vert. belt.
Shaper, 7" Rhodes, vert. & hor. hds.

FOR SALE BY

Reliance Machinery Sales Company

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Drill, 6 spindle Prentiss b. b., No. 2 Morse taper, power feed.
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Millers, vert., 8B and 5C Becker.
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Presses, No. 16 Bliss boming.
Presses, Nos. 18 and 19 Bliss, o. b. i.
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Grinder, No. 55 Heald.
Grinder, 10"x52" Landis, self contained, plain.
Hammer, 800 lb. Erie, steam forging.
Hammer, 1100 lb. NBP. steam forg.
Hammer, 2000 lb. Chambersburg double frame steam.
Lathe, 24"x10' Greaves-Klusman, belt drive, quick change.
Lathe, 24"x18' Hamilton, belt drive.
Lathe, 18"x8' Champion, belt drive, with taper attachment.
Lathe, 66"x38' Bement, motor drive.
Miller, No. 4B Becker vertical, table 10"x26".
Miller, No. 1½ Cincinnati Univ. tbl. 36"x9", belt drive.
Miller, No. 1½ Rockford plain, belt drive, table 9"x32½"
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Drill, Demco h. s., b. b., ⅝" capacity	135.
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Drill, 4 spindle, Avey, h. s., b. b., 14" swing, No. 2 M. T.	400.
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L. & A., 1½" thru 1", 36" T. m. d.
No. 2H. & J., hor., 1" thru 1", 15" gap, motor drive.
No. 3 H. & J., 1½" thru 1"; Shear 2⅛" rd., 30 T., motor drive.
No. 6 Beatty, 1" thru 1", 36" T., m. dr.
No. 5 Beatty flyw., ¾" thru ½" m. d.
No. 11 Beatty h. duty, beam, 2½" str.
Rock River, ⅞" thru ¾", 36" T. m. d.
No. 2 H. & J., barshear, 1¾" rd., m. d.
No. 1 H. & J., barshear, 1½" rd., m. d.
No. 000 H. & J., bar shear, 1" rd., m. d.
No. 11 Whiting beam, 2—1" thru 1", motor drive.
No. 0 Yankee punch, 10 gauge, b. d.
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Nia. rotary shear, 16 gauge, hand pwr.
No 6 H. & J., ⅞"x96", 36" thr., m. d.
No. 6½ H. & J., 1"x96", 36" thr., m. d.
Loy-Nawrath, 3/16"x10' back gauge, motor drive.

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D. & K., ⅜"x12' leaf brake, m. d.
Plate leveling roll, 1"x8'.
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Bending roll, ½"x10', m. d.

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No. 27—W-W. Bulldozer, b. d.
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Cleve. beam bender, 15" beam, m. d.

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3—75 lb. Bradley upright helve, b. d.
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1—Naze. 100 lb., motor drive.

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1—Erie, 7½-ton, span 57', d. c.

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Allen, ⅝", 6" reach, 8-⅝" gap, (2).
Hanna, 10", cyl., 8" reach, 8" gap.
Allen, ⅞", 8" reach, 8" gap (3).
Hanna, ⅞", 8" reach, 8¼" gap, (2).
Hanna, ⅞", 8" reach, 13½" gap.
Allen, ⅞", 8" reach, 13-⅞" gap, (2).
Allen, ⅞", 34" reach, 15" gap.
Allen, ⅞", 47" reach, 15" gap, (2).
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Gould triplex, 8"x5", 2" suction, 2" disc., motor drive.
Challenge hand, double action, 1½". discharge.
Dean, 4"x3", 3 plunger, b. d.
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Rotary, 4½" intake, 4" discharge, b. d.

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Thompson, 40 k. w., 44" rch., 440-3-60
Toledo, 25 k. w., 24" rch., 440-3-60.

MISCELLANEOUS

14½ G Metropolitan steam injectors.
No. 6 Sturtevant blower.
No. 8 Sturtevent blower.
Acme bolt thread, 2", (3).
B. & K. pipe threader, 4".
Columbus pipe thread, 6".
Geared hand power pipe threader 1¼ to 6", r. and l. dies.
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Lewis rail breaker, motor drive.
150-ton Putnam wheel press.
200-ton Putnam wheel press.
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Oliver, No. 3 wood trimmer.
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No. 314 Baker, heavy duty, h. s. (2).
Cinc. uprights, from 21" to 36", (20).

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No. 3 Van Norman Duplex, arr. m.d.
No. 2 Rockford plain, all geared.
2—No. 2 Kempsmith cone drive, pl.
No. 2 P. & J. dbl., table, auto.
No. 2A, heavy, B. & S., univ.
4" Newton, double spdl. spline mill.
No 22 Garvin, vertical mill.
Model B Becker, vertical, 24" rotary table, m. d.

GRINDERS

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14x36 Queen City, self contained.
10x36 Landis self contained.
No. 70 Heald internal.
No. 51 Greenfield Hydrolhyd. internal
No. 65 Heald internal.
No. 7½ Gardner double-end disc, B.B.
No. 1 W. & M. univ. tool & cutter.

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18"x8' Monarch q. c. belt drive.
16"x6' Sidney h. d. belt dr., late type.
16"x8' Monarch, q. c. belt drive.
16"x6' Sidney, q. c., t. s. belt drive.
14"x8' Sidney, all geared, m. d., q. c.
12"x5' Hendey q. c. belt drive.
14" W. & S. p. h. turret, auto. chk. (6)
No. 4 W. & S. f.g.h. hand scr. mche.
No. 5 Foster f.g.h. hand screw mche.

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No. 54 Toledo s. s. plain.
No. DDG4 Ferracute cam-drawing.
No. 4 Bliss, stiles type.
No. 57 Toledo s. s. b, g. 6" stroke.

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2—24" Gould & Eberhart, b.g. shapers.
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18"x8' Lodge & Shipley selec. hd.
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20"x6' Hendey geared head.
20"x8' American geared head.
21"x10' LeBlond geared head, taper.
24"x12' Lodge & Shipley, cone, taper.
27"x12' American, taper.
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1—72"x35' Bement Heavy Duty.
1—65"x32' Bement Hvy. Duty.
1—56"x18' Niles-B-Pond Hvy. Duty.
2—52"x34' Putnam Heavy Duty.
1—48"x28' Niles-B-Pond Hvy. Duty.
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No. 3 Cincinnati Vert. Mill, s. p. d.
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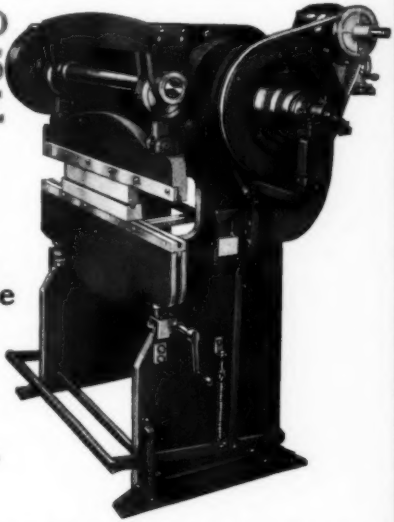

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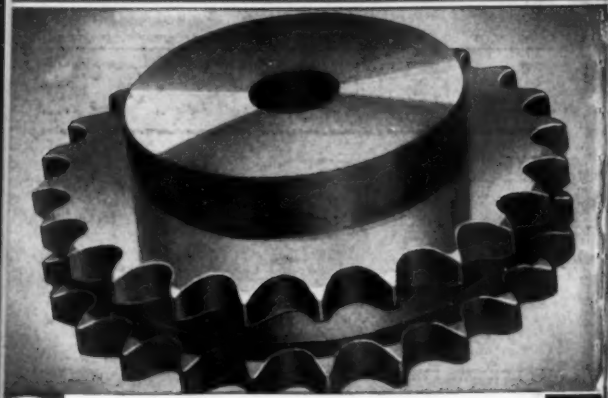

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